

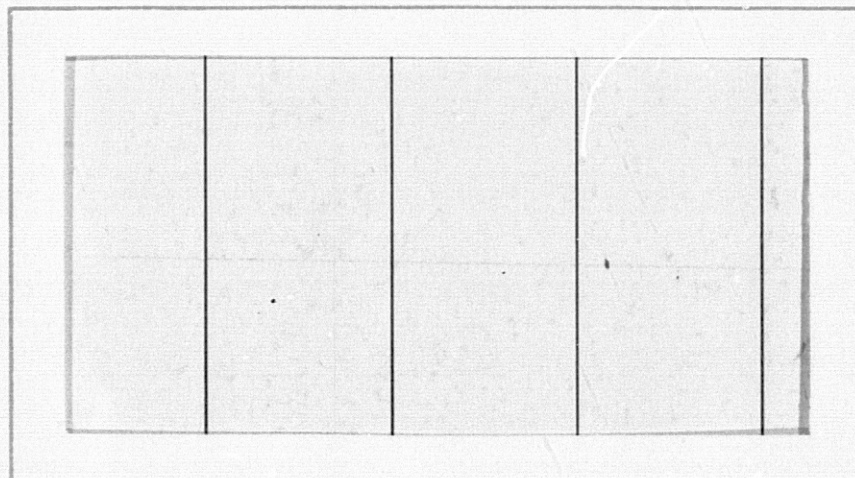
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EX

Vol
TV



(NASA-CR-143970) TRACK/TRAIN DYNAMICS TEST
REPORT TRANSFER FUNCTION TEST. VOLUME 4:
DATA BOOK, x-AXIS TESTS, ACTUATORS 180 DEG
OUT OF PHASE. RUN 30. z-AXIS TESTS, SINGLE
ACTUATOR. RUN 46 (Martin Marietta Corp.)

N75-33404

Unclas
G3/37 42663

MARTIN MARIETTA

POST OFFICE BOX 179, DENVER, COLORADO 80201



TR-005-TF

30 May 1975

TRACK/TRAIN DYNAMICS

TEST REPORT

TRANSFER FUNCTION TEST

Volume IV

Data Book

X-Axis Tests

Actuators 180° Out of Phase

Run 30

Z-Axis Tests

Single Actuator

Run 46

TABLE I. DATA INDEX - VOLUME IV

MEAS. NO.	XDCR SENSI- TIVITY	RUN NUMBER VS PAGE NUMBER									
		RUN 30	RUN 46								
FL3/OSC	15K#/V 17.651V	pp. 9	pp. 81	(FV1/OSC.)							
FL4	↓	10									
FL4/FL3	15K#/V 15K#/V	11									
FV2	20K#/V 15K#/V	12	82	(FV2/FV1) NOTE:	FV1 is the reference measurement for Run 46						
FV4	↓	13	83								
DV1	0.5"/V 15K#/V	14 15	84								
DV2	↓	16	85 86								
DV3	↓	17 18	87								
DV4	↓	19 20	88								
AV1	1Gp/V 15K#/V	21	89								
AV2	↓	22	90 91								
AV3	↓	23 24	92								
AV4	↓	25 26	93								
AV5	↓	27 28	94								
AV6	↓	29 30	95								
AL1	↓	31 32 33	96								
AL2	↓	34 35	97								
AL3	↓	36	98								
AL6	↓	37 38	99								
AL7	↓	39 40	100								
AL11	↓	41 42	101								
P	3.5Kpsi/V 15K#/V	43									
AL4	1Gp/V 15K#/V	44 45	102								
AL5	↓	46 47	103								
AL8	↓	48 49	104								
AL9	↓	50 51	105								
AL10	↓	52 53	106								
AL12	↓	54	107								
DL1	0.5"/V 15K#/V	55 56	108								
DL2	↓	57	109								
DL3	↓	58	110								
DL4	↓	59 60	111								
DL5	↓	61 112 113									
DL6	↓	62 63	114								
DL7	↓	64	115								
DL8	↓	65	116								
DL9	↓	66	117								

[illegible]

VOLUME IVRUN 30 TEST DATA

X-AXIS, 6010 POUND/ACTUATOR TEST LEVEL,
ACTUATORS 180° OUT OF PHASE

1 HEADING: TRAIN TRACK TRANS 6010LB LONG. OUT PH. 3/26/75

SWEEP PARAMETERS:

2 MODE 1=LOG, 0=LIN: 1.
 3 TYPE 1=UNI-DIRECTIONAL, 0=BI-DIRECTIONAL: 1.
 4 START, END FREQ, HZ: .5 50.
 FREQ RANGE -- OCTAVES, DECADES: 6.644 2.
 5 SPECIFICATION 1=RATE, 0=DURATION: 1.
 6 UNITS 1=OCT/MIN, 0=DEC/MIN: 1.
 7 RATE, OCT/MIN: 2.
 SWEEP DURATION -- MIN, SEC: 3. 19.

TEST LENGTH:

8 SPECIFICATION 1=TIME, 0=SWEEP CYCLES: 0.
 9 CYCLES: 1.
 TEST TIME -- HRS, MIN, SEC: 0. 3. 19.

START-UP AND SHUT-DOWN:

10 START-UP TIME, SEC: 120.
 11 SHUT-DOWN TIME, SEC: .5

VIBRATION LIMITS (P-P):

12 DISPLACEMENT, IN: 5000.
 13 VELOCITY, IN/SEC: 9999.
 14 ACCELERATION, G: 450.

REFERENCE CONTROL SPECTRUM:

15 TYPE, VALUE, FREQ, ABORT LIMIT:	2.	40.	.5	7.
16 TYPE, VALUE, FREQ, ABORT LIMIT:	3.	60.	1.3	6.
17 TYPE, VALUE, FREQ, ABORT LIMIT:	2.	60.	50.	4.
18 TEST LEVEL (DB BELOW REF):	3.5			

ACCELERATION SIGNALS:

19 NR OF SIGNALS: 2.
 CHANNEL NRS: 1. 2.
 20 1=PEAK, 0=RMS: 0.
 21 SENSITIVITY, MV/G: 20.
 22 STRATEGY 1=MAX, 0=AVG: 1.

LIMIT SIGNALS:

23 NR OF SIGNALS: 0.

ABORT LINES:

24 NR OF LINES: 0.

ALARM LINES:

25 NR OF LINES: 0.
 26 1=DUAL-CHANNEL A/D, 0=ACE: 1.
 27 COMPRESSION SPEED 2=HIGH, 1=NORMAL, 0=LOW: 1.

POST-TEST DOCUMENTATION

6

TRK TRN TRANS FUNCT TEST 6010LB X-AXIS 3/26/75

COMPLETION STATUS: ABORTED DURING SWEEP 1 AT 36.99 HZ.
MAXIMUM DRIVE LIMIT.

TEST DURATION -- HRS, MIN, SEC: 0 3 6

MAX ABS CONTROL ERROR: 3.6 DB AT 19.42 HZ.
AVG ABS CONTROL ERROR: .5133 DB.CONTROL
CHANNEL

FREQ RANGE (HZ)

SWEEP 1

1	.5	--	.5
2	.5	--	1.341
1	1.341	--	12.98
2	12.98	--	13.06
1	13.06	--	13.34
2	13.34	--	13.39
1	13.39	--	14.48
2	14.48	--	14.59
1	14.59	--	15.35
2	15.35	--	15.58
1	15.58	--	16.29
2	16.29	--	16.55
1	16.55	--	17.03
2	17.03	--	17.13
1	17.13	--	18.
2	18.	--	18.1
1	18.1	--	18.17
2	18.17	--	18.23
1	18.23	--	18.49
2	18.49	--	18.52
1	18.52	--	18.8
2	18.8	--	18.84
1	18.84	--	18.99
2	18.99	--	19.03
1	19.03	--	19.24
2	19.24	--	19.52
1	19.52	--	19.76
2	19.76	--	19.8
1	19.8	--	19.91
2	19.91	--	19.95
1	19.95	--	20.95
2	20.95	--	21.
1	21.	--	21.08
2	21.08	--	21.12
1	21.12	--	21.19
2	21.19	--	21.2
1	21.2	--	21.22
2	21.22	--	21.26
1	21.26	--	21.36
2	21.36	--	21.4
1	21.4	--	21.9
2	21.9	--	21.92
1	21.92	--	22.2
2	22.2	--	22.24
1	22.24	--	22.27
2	22.27	--	22.3

CONTINUED

POST-TEST DOCUMENTATION (CONTINUED)

7

1	22.3	--	22.45
2	22.45	--	22.47
1	22.47	--	22.6
2	22.6	--	22.62
1	22.62	--	22.64
2	22.64	--	22.7
1	22.7	--	22.74
2	22.74	--	22.79
1	22.79	--	22.91
2	22.91	--	22.93
1	22.93	--	23.08
2	23.08	--	23.12
1	23.12	--	23.27
2	23.27	--	23.43
1	23.43	--	24.95
2	24.95	--	24.97
1	24.97	--	25.06
2	25.06	--	25.15
1	25.15	--	25.32
2	25.32	--	25.39
1	25.39	--	25.48
2	25.48	--	25.51
1	25.51	--	25.58
2	25.58	--	25.62
1	25.62	--	25.71
2	25.71	--	25.91
1	25.91	--	25.94
2	25.94	--	26.15
1	26.15	--	26.17
2	26.17	--	26.2
1	26.2	--	26.44
2	26.44	--	26.57
1	26.57	--	26.63
2	26.63	--	26.71
1	26.71	--	26.86
2	26.86	--	26.9
1	26.9	--	27.05
2	27.05	--	27.13
1	27.13	--	27.26
2	27.26	--	27.34
1	27.34	--	27.36
2	27.36	--	27.44
1	27.44	--	27.46
2	27.46	--	27.51
1	27.51	--	27.79
2	27.79	--	27.84
1	27.84	--	27.92
2	27.92	--	28.07
1	28.07	--	28.13
2	28.13	--	28.28
1	28.28	--	28.41
2	28.41	--	28.52
1	28.52	--	28.68
2	28.68	--	28.81
1	28.81	--	28.86
2	28.86	--	28.97
1	28.97	--	29.11
2	29.11	--	29.22
1	29.22	--	29.45
2	29.45	--	29.49
1	29.49	--	29.6
2	29.6	--	29.71

CONTINUED

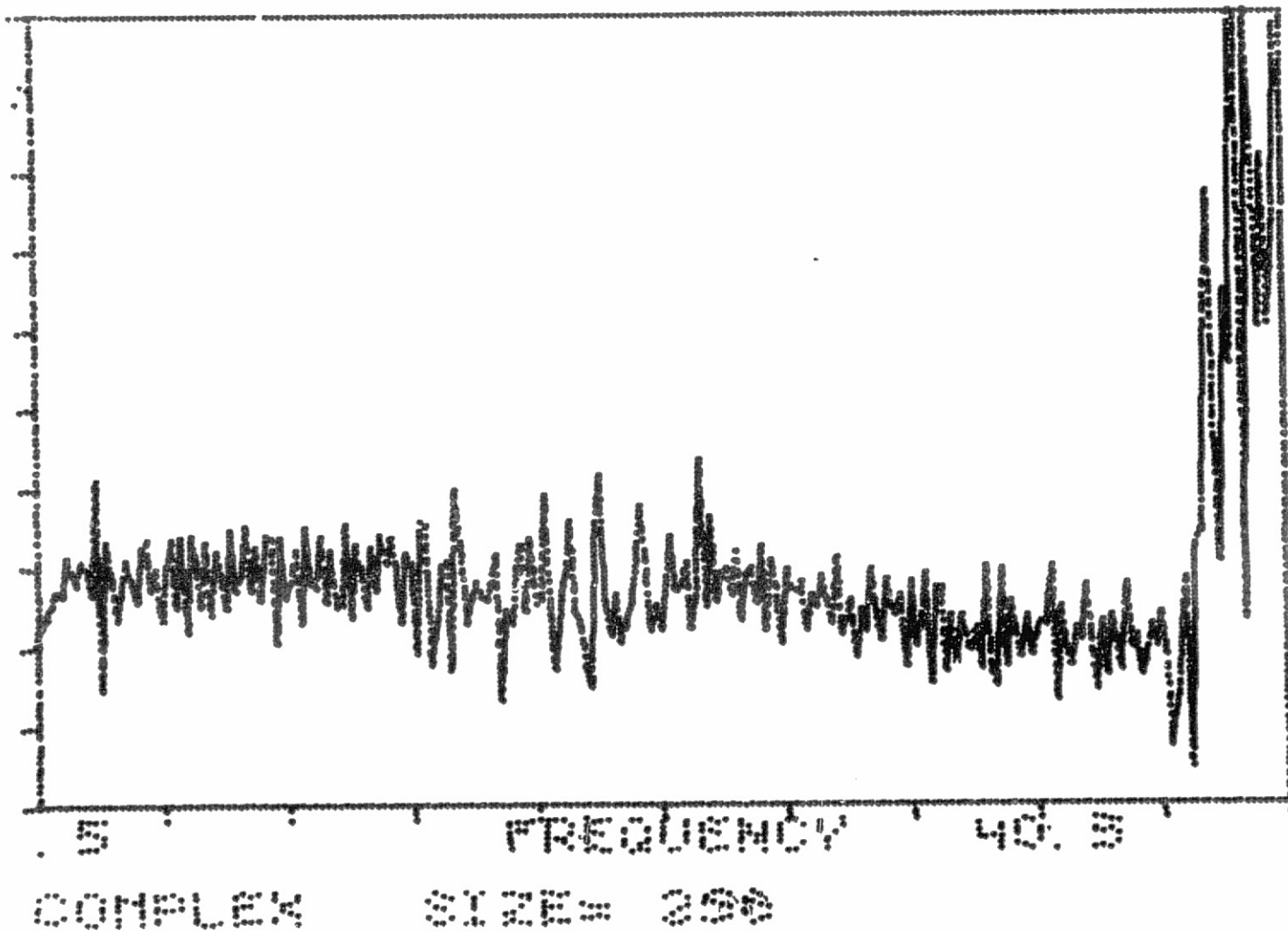
POST-TEST DOCUMENTATION (CONTINUED)

1	29.71	--	29.86
2	29.86	--	29.98
1	29.98	--	30.09
2	30.09	--	30.29
1	30.29	--	30.39
2	30.39	--	30.51
1	30.51	--	30.62
2	30.62	--	30.74
1	30.74	--	30.94
2	30.94	--	31.04
1	31.04	--	31.1
2	31.1	--	31.25
1	31.25	--	31.42
2	31.42	--	31.54
1	31.54	--	31.63
2	31.63	--	31.75
1	31.75	--	31.93
2	31.93	--	32.04
1	32.04	--	32.17
2	32.17	--	32.35
1	32.35	--	32.47
2	32.47	--	32.58
1	32.58	--	32.77
2	32.77	--	32.86
1	32.86	--	33.04
2	33.04	--	33.16
1	33.16	--	33.37
2	33.37	--	33.44
1	33.44	--	33.62
2	33.62	--	33.85
1	33.85	--	33.88
2	33.88	--	34.07
1	34.07	--	34.25
2	34.25	--	34.32
1	34.32	--	34.51
2	34.51	--	34.67
1	34.67	--	34.83
2	34.83	--	34.99
1	34.99	--	35.15
2	35.15	--	35.31
1	35.31	--	35.48
2	35.48	--	35.64
1	35.64	--	35.77
2	35.77	--	35.87
1	35.87	--	35.9
2	35.9	--	35.94
1	35.94	--	36.2
2	36.2	--	36.51
1	36.51	--	36.57
2	36.57	--	36.61
1	36.61	--	36.75
2	36.75	--	36.85
1	36.85	--	36.99

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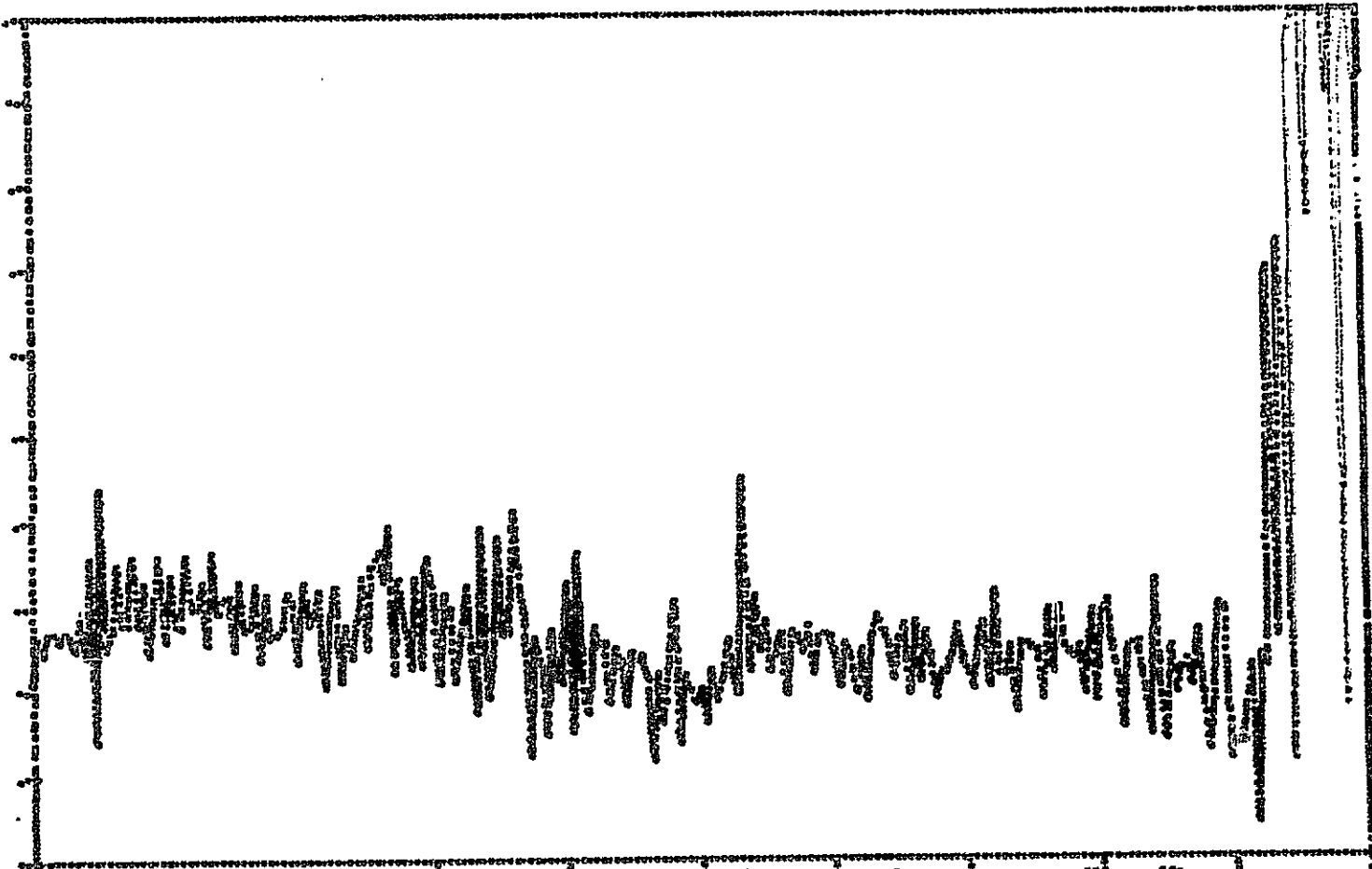
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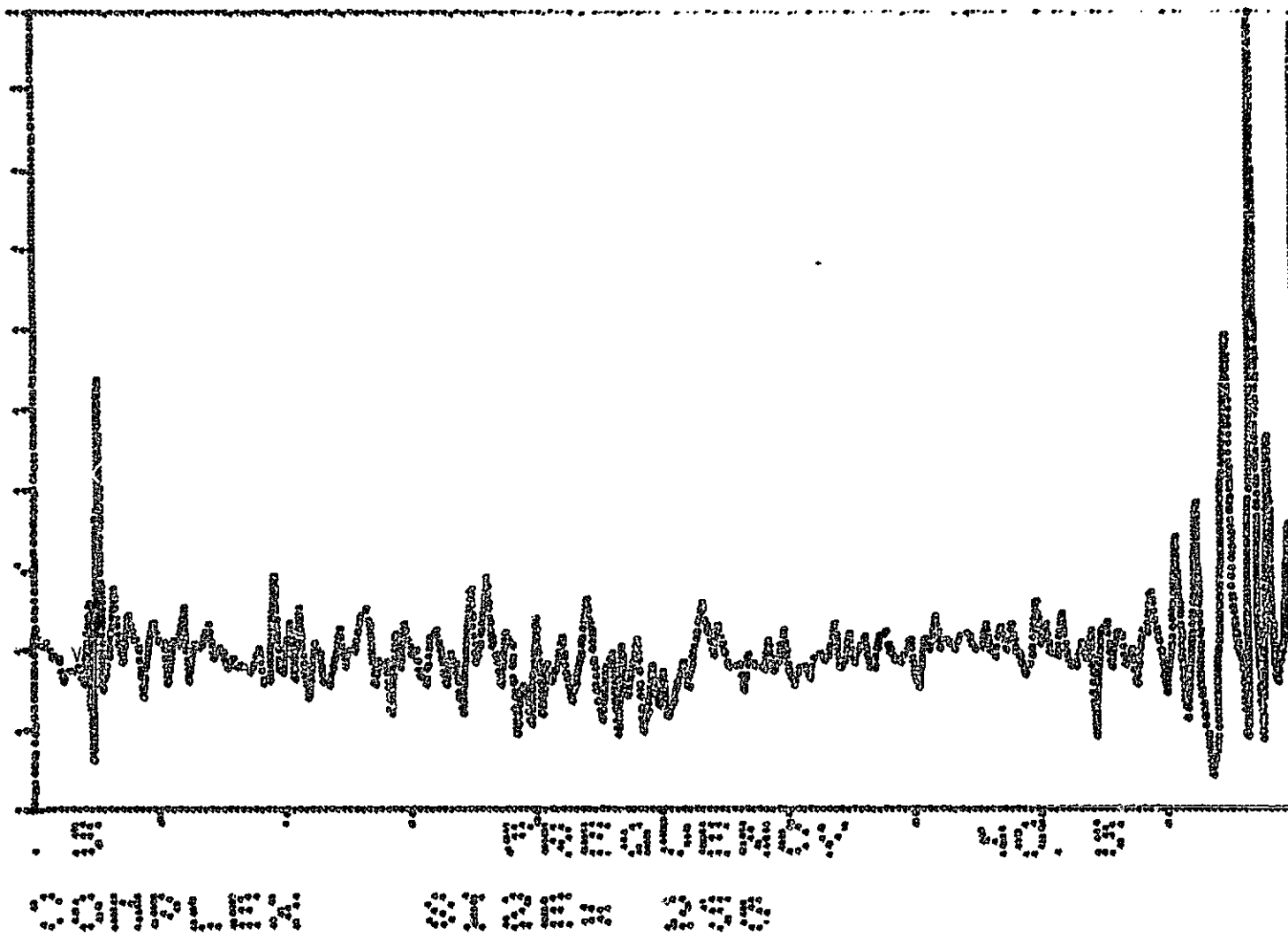


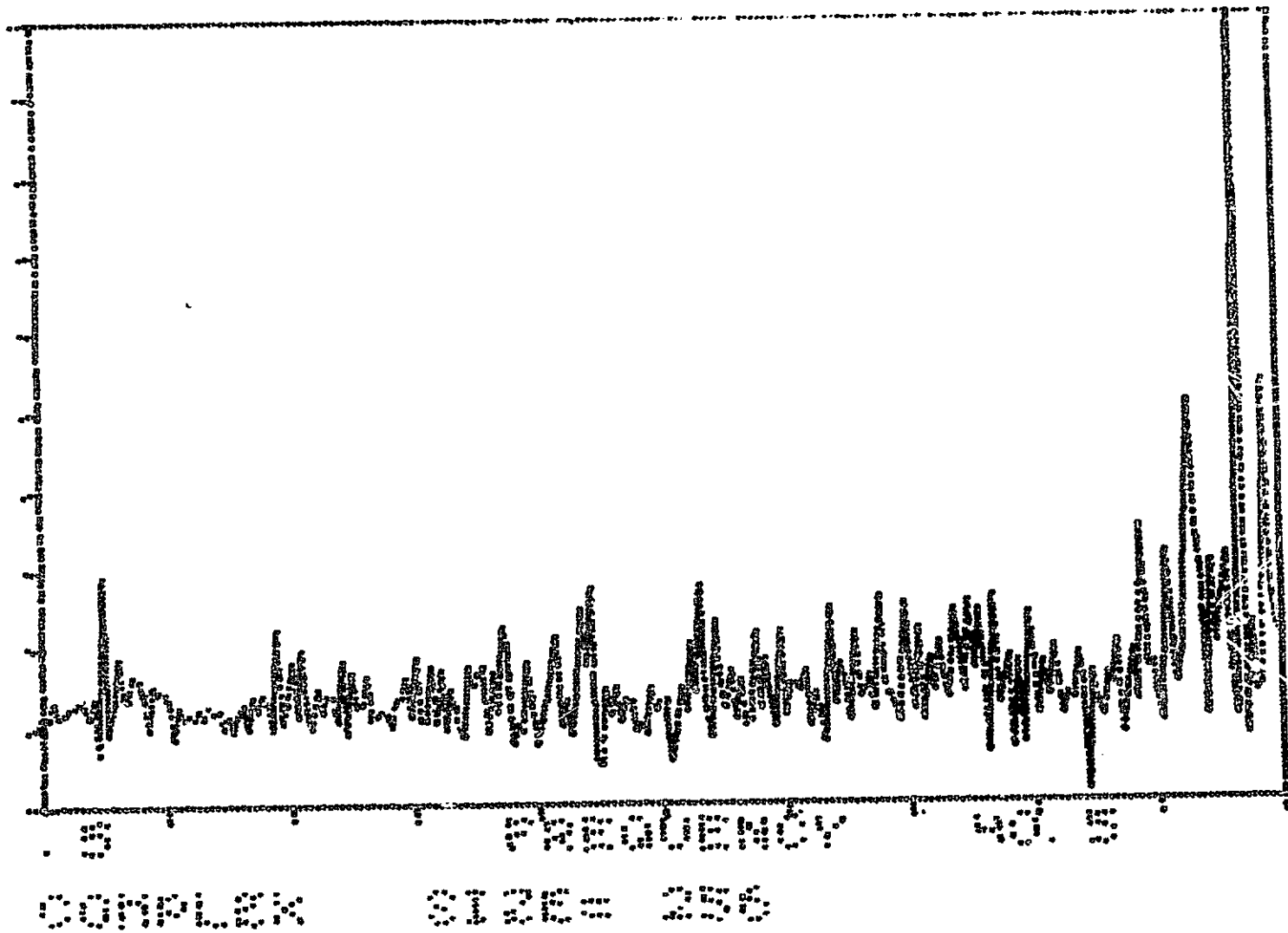
FL3/OSC.

FL4/OSC.

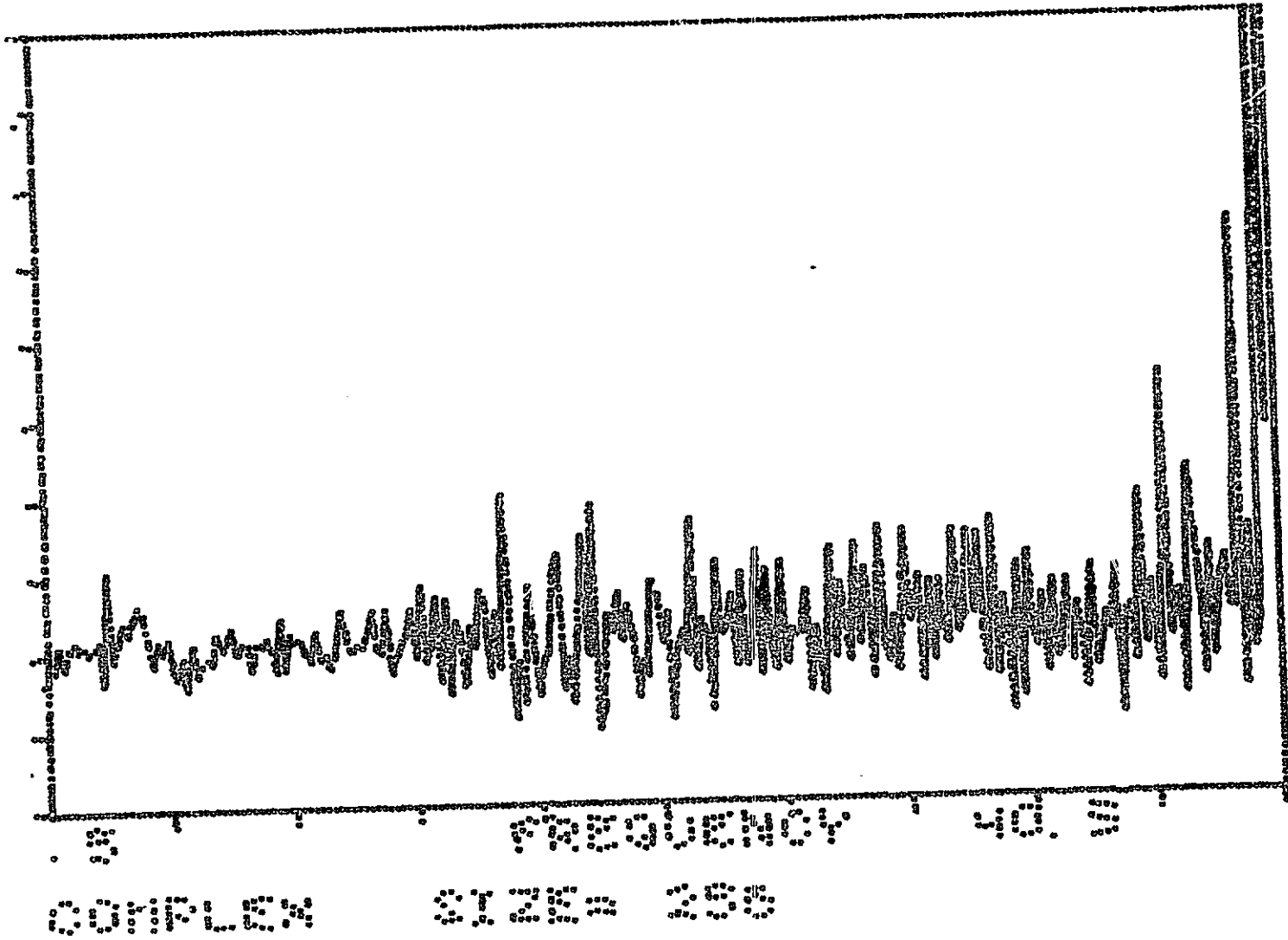


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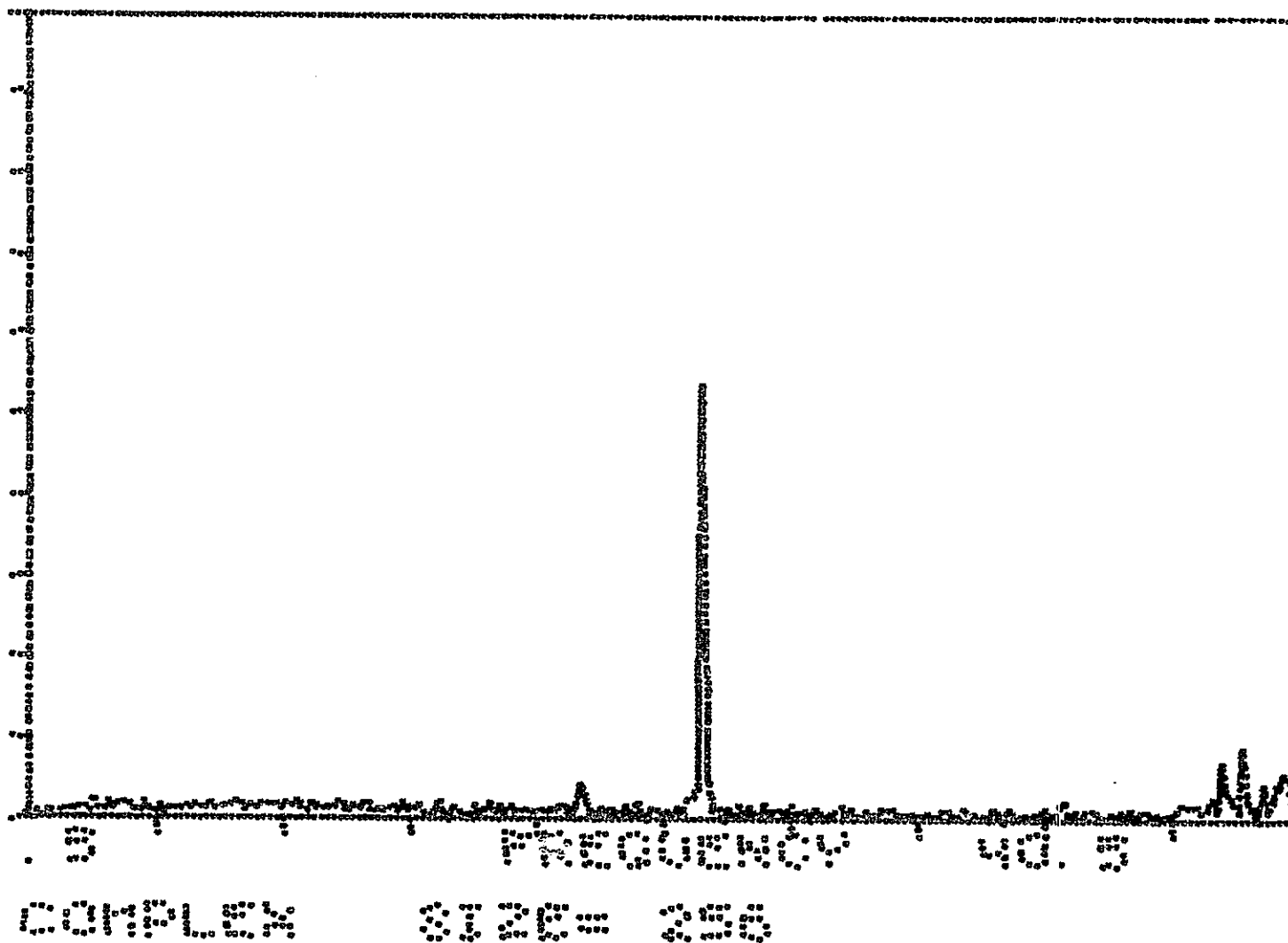
FV2/FL3



FV4/FL3

REPORT

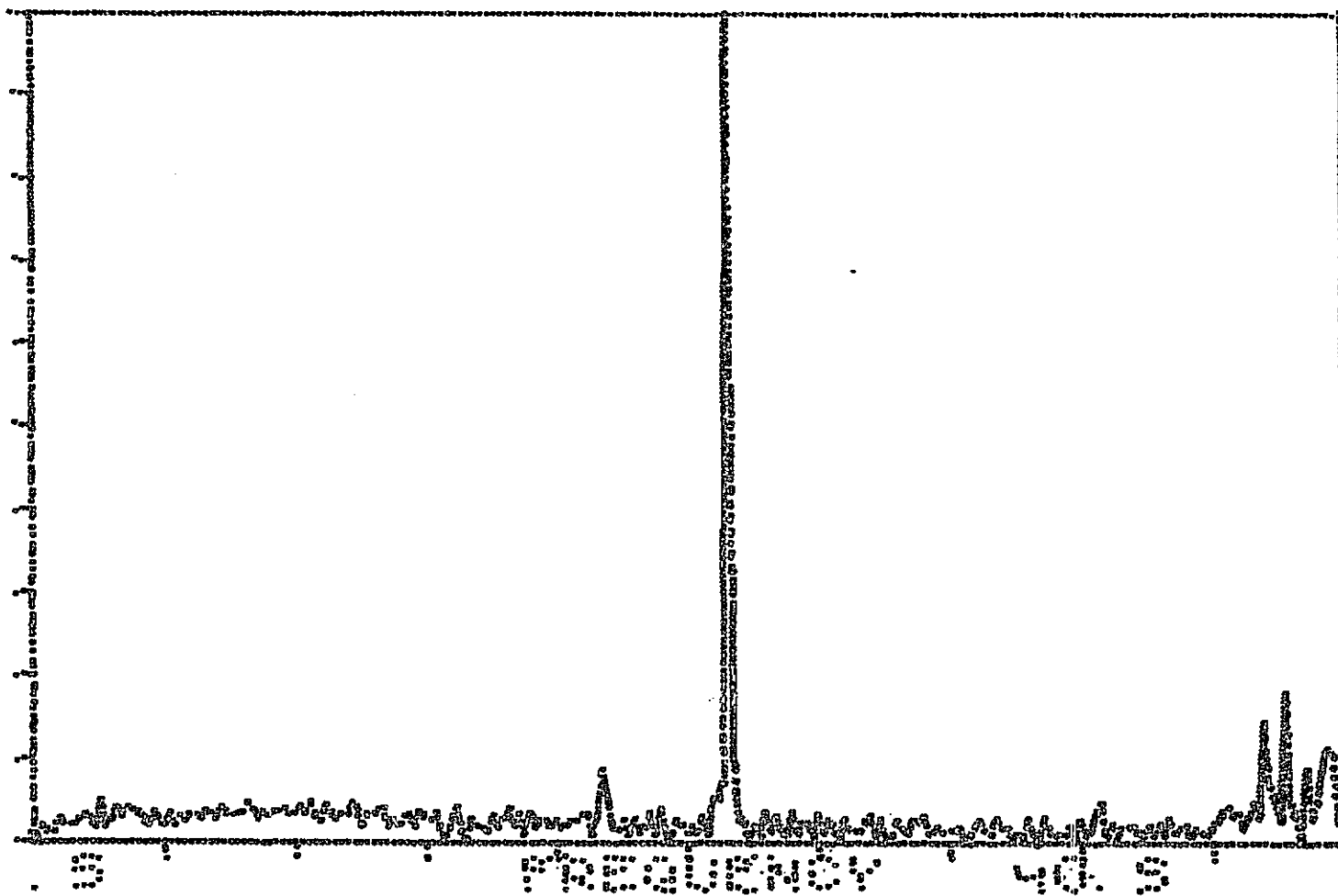
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DV1/FL3

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SECRET



CORPUS

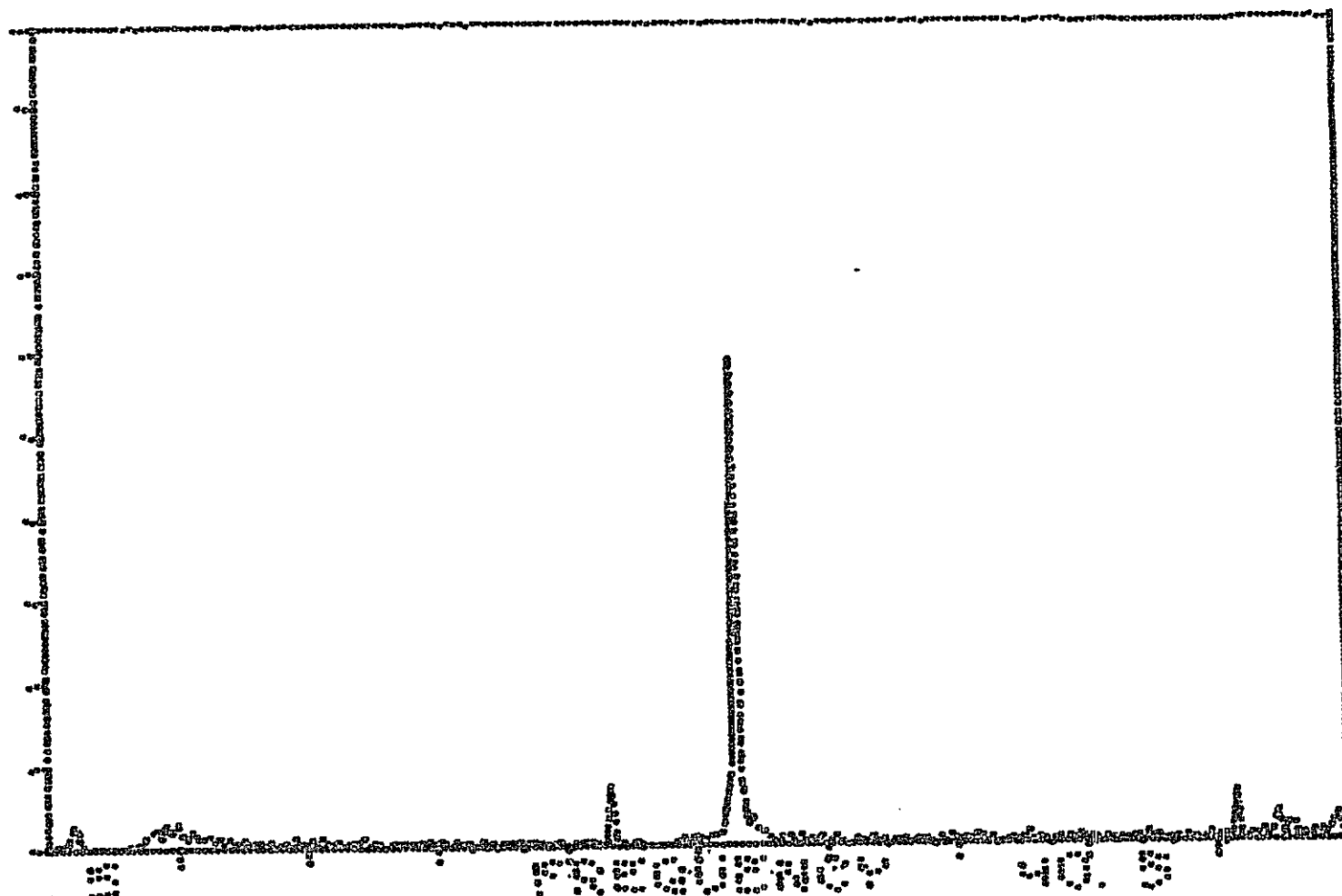
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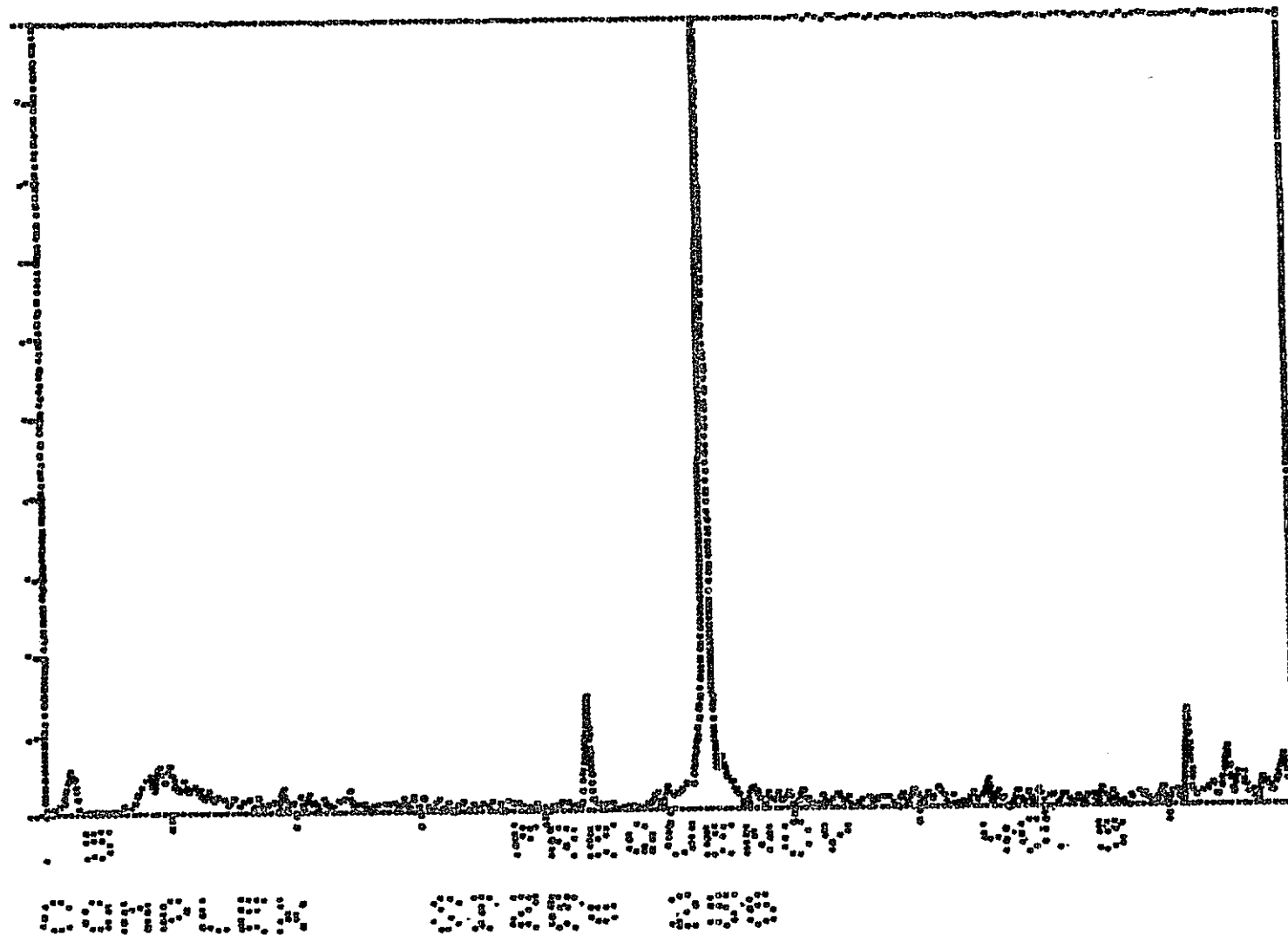
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DV3/FL3

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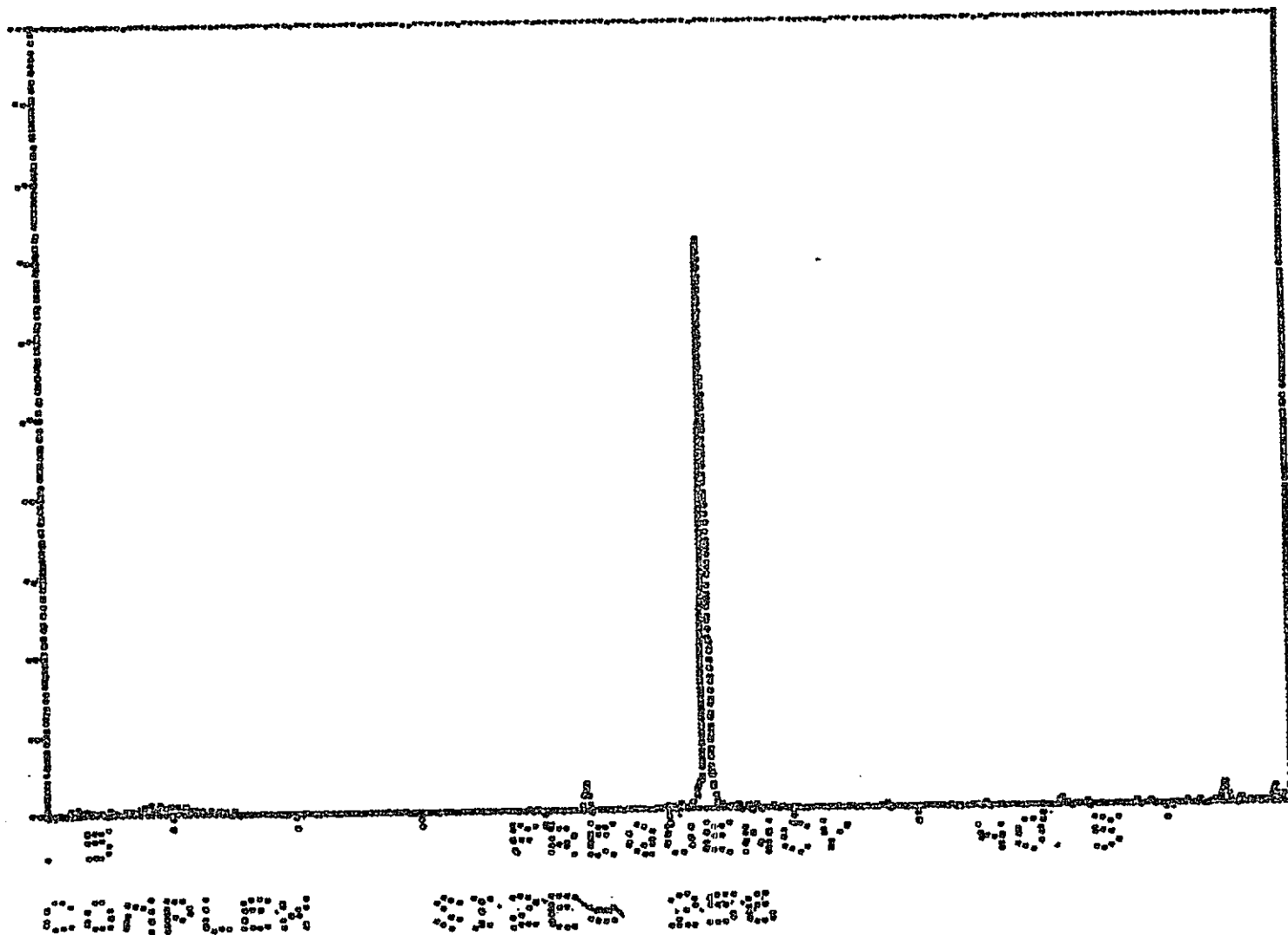


DV3/FL3

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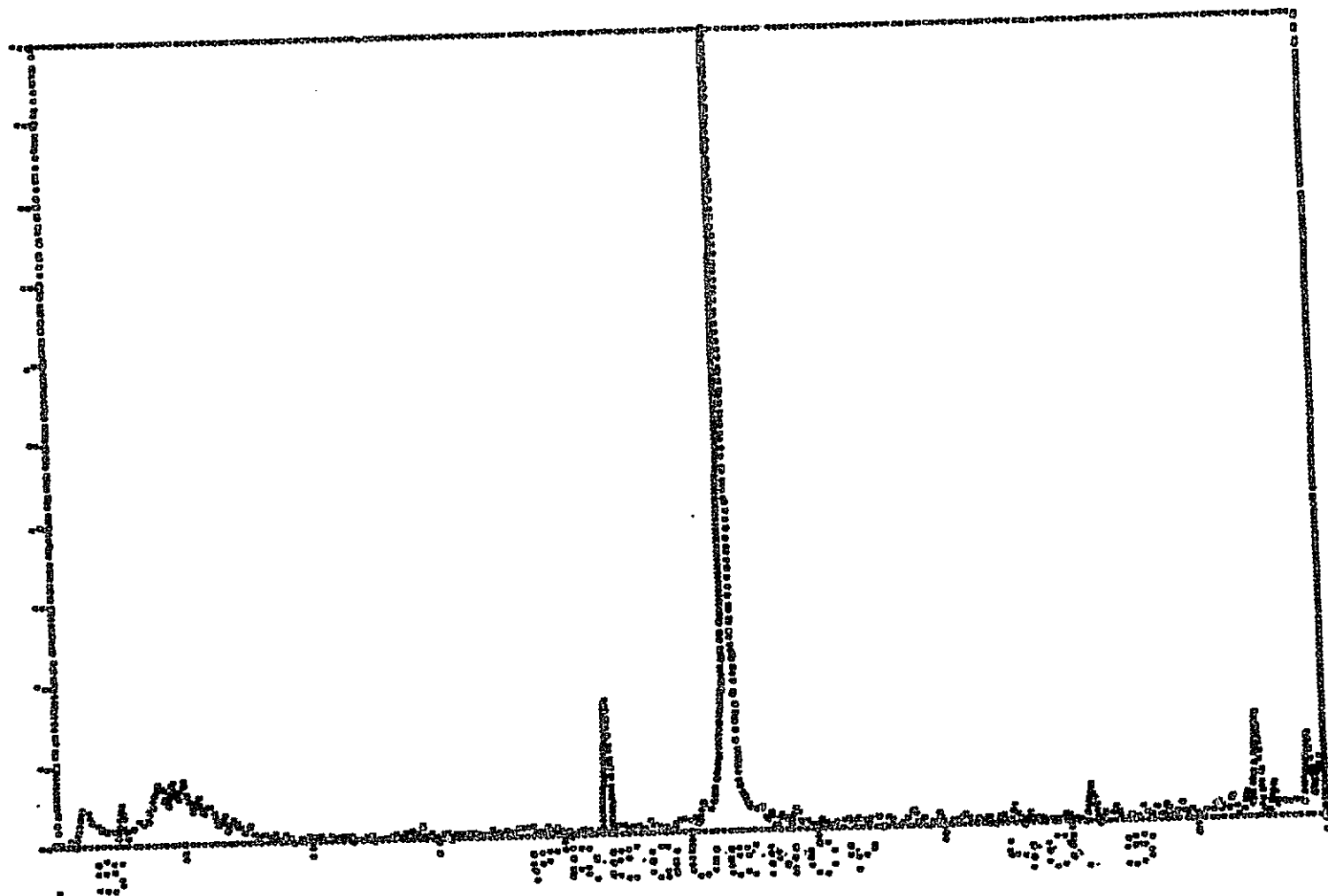


DV4/FL3

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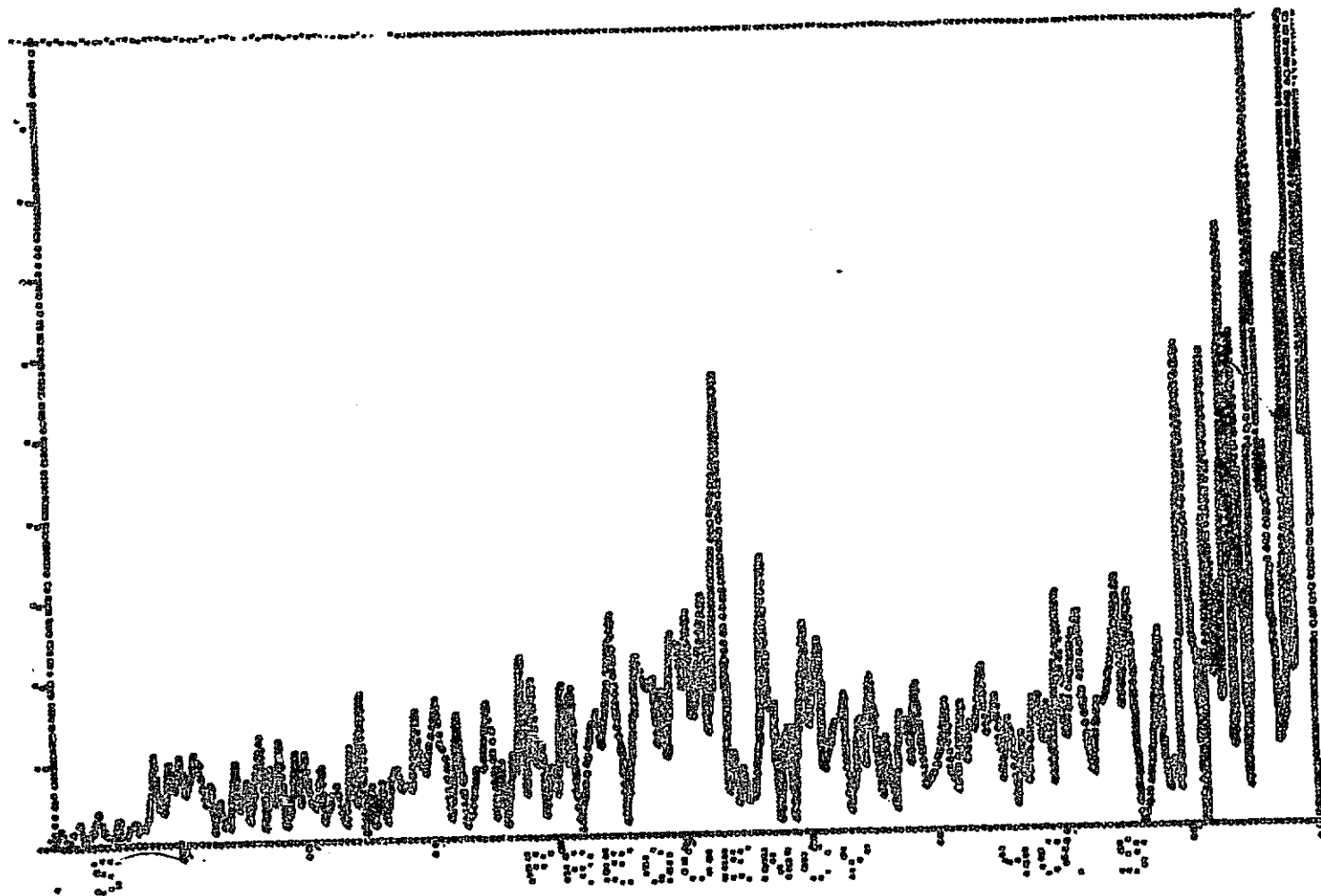
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DV4/FL3



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REPORT

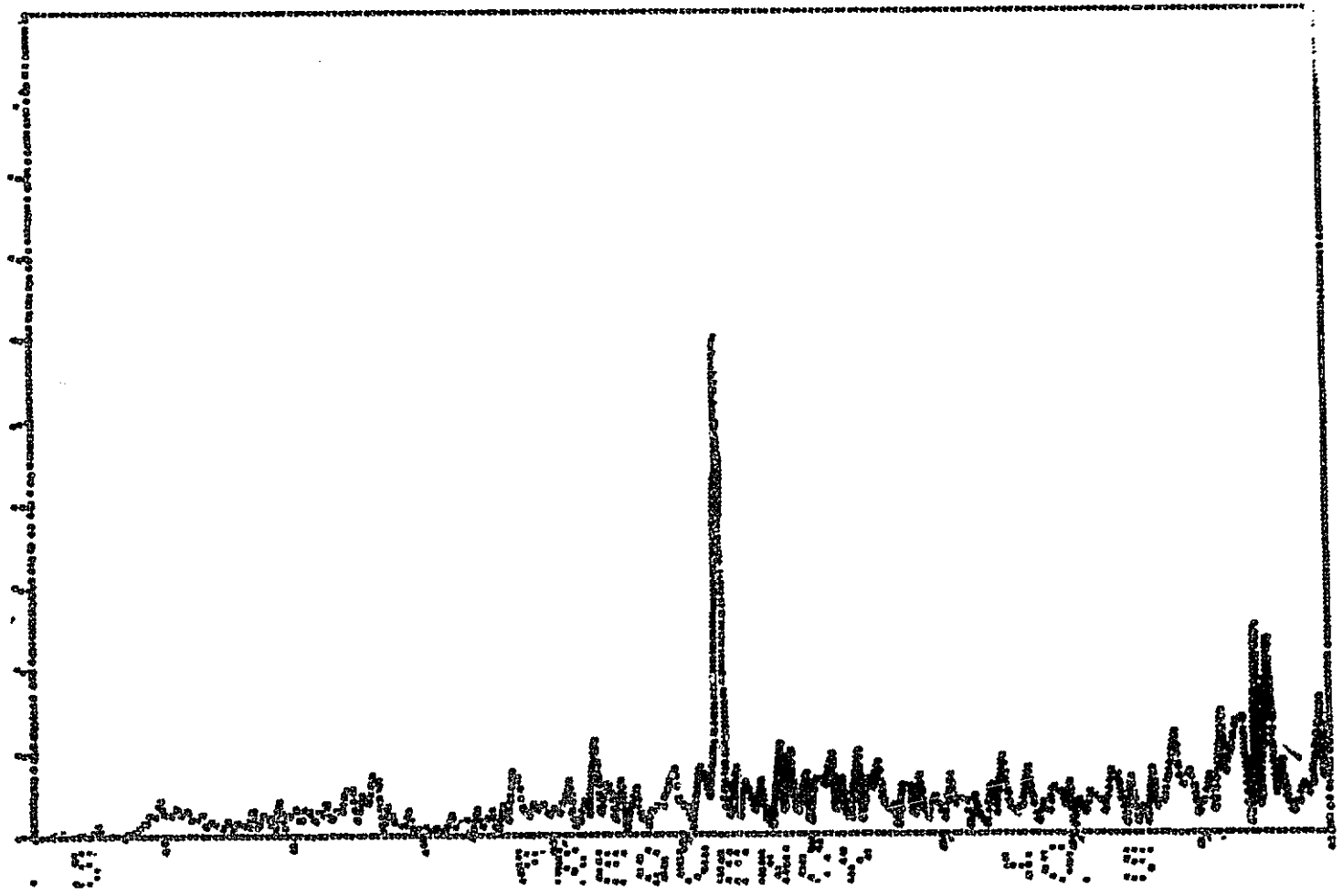
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AV1/FL3

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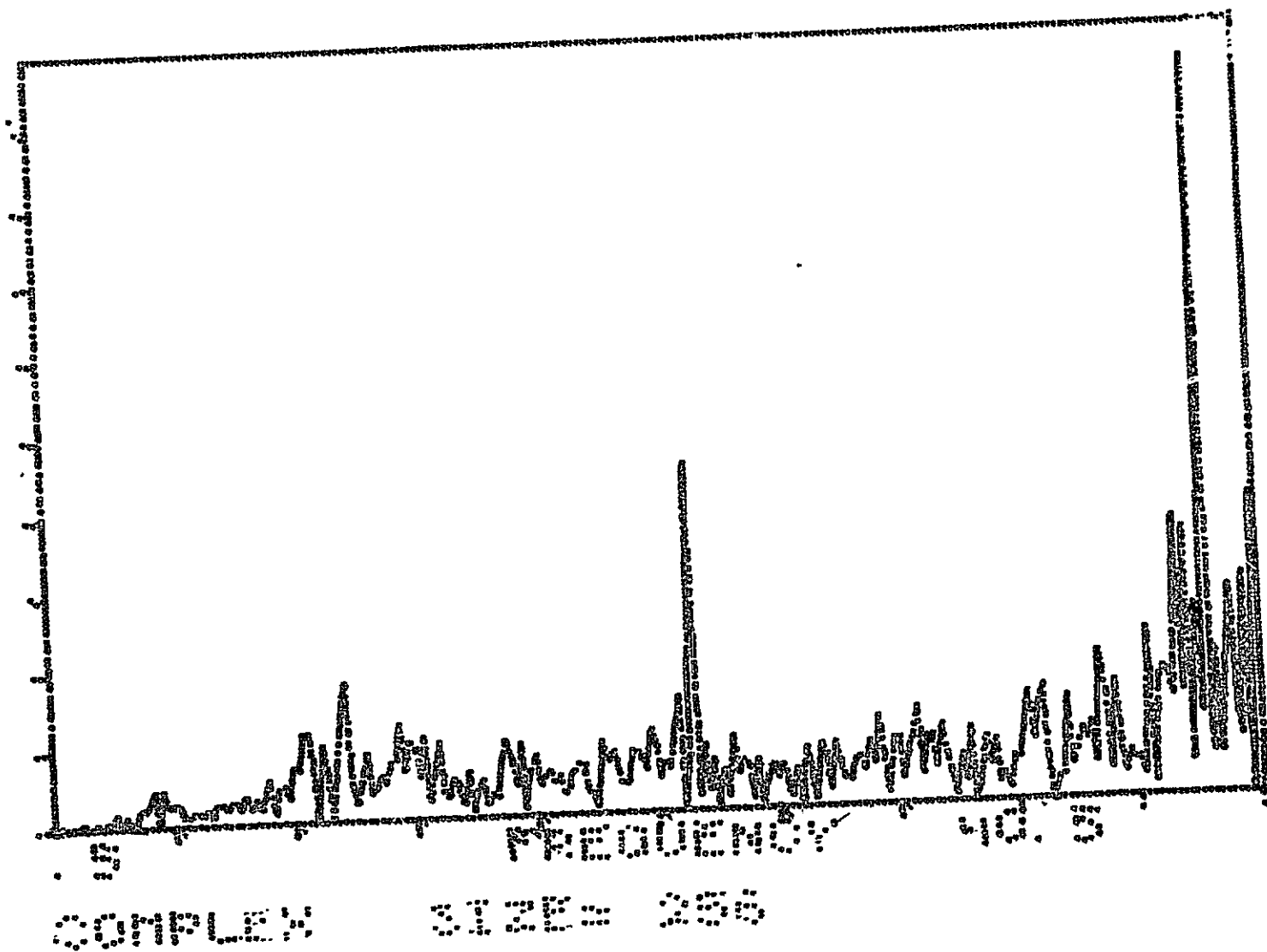
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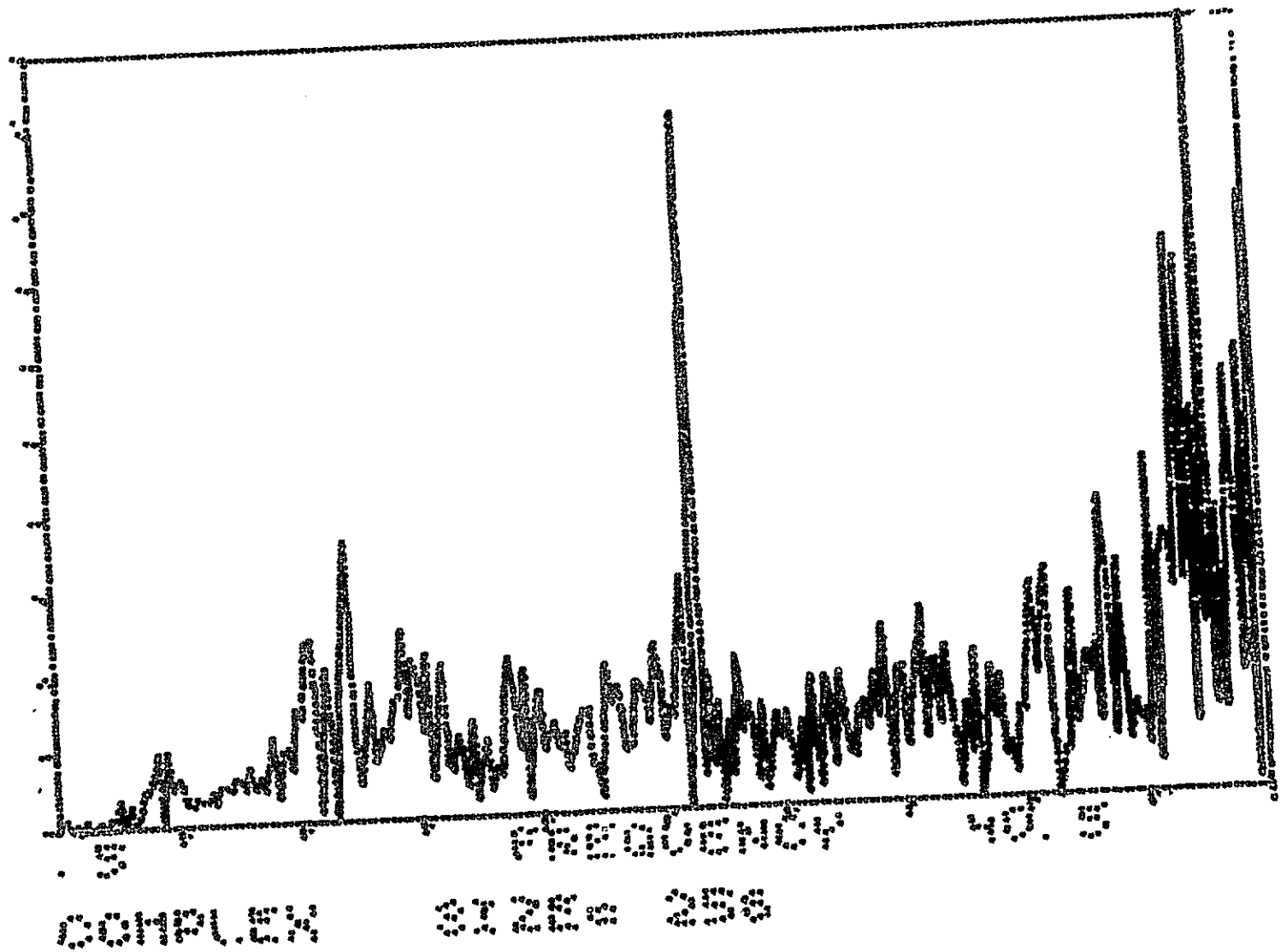
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AV2/FL3



AV3/FL3

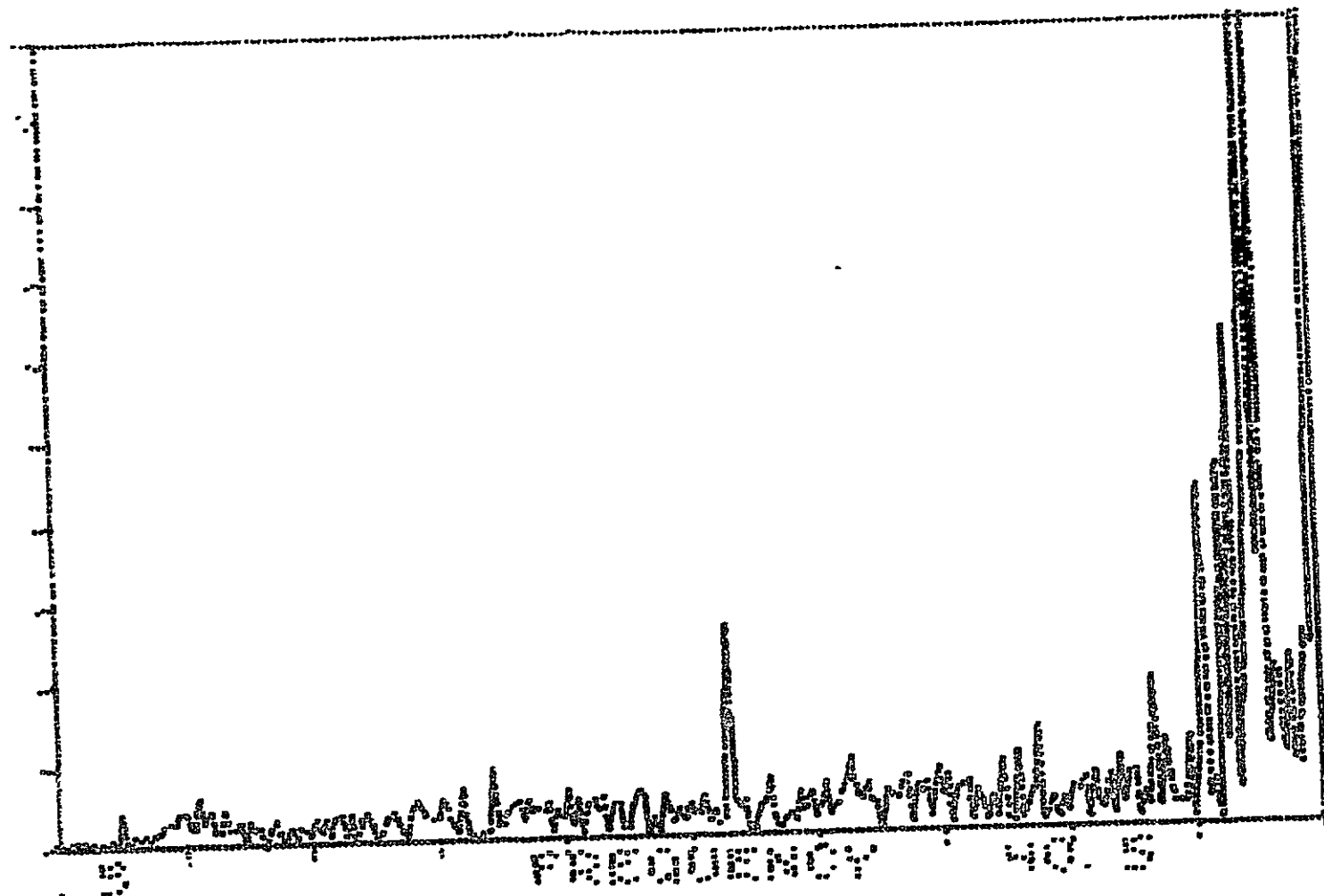


AV3/FL3

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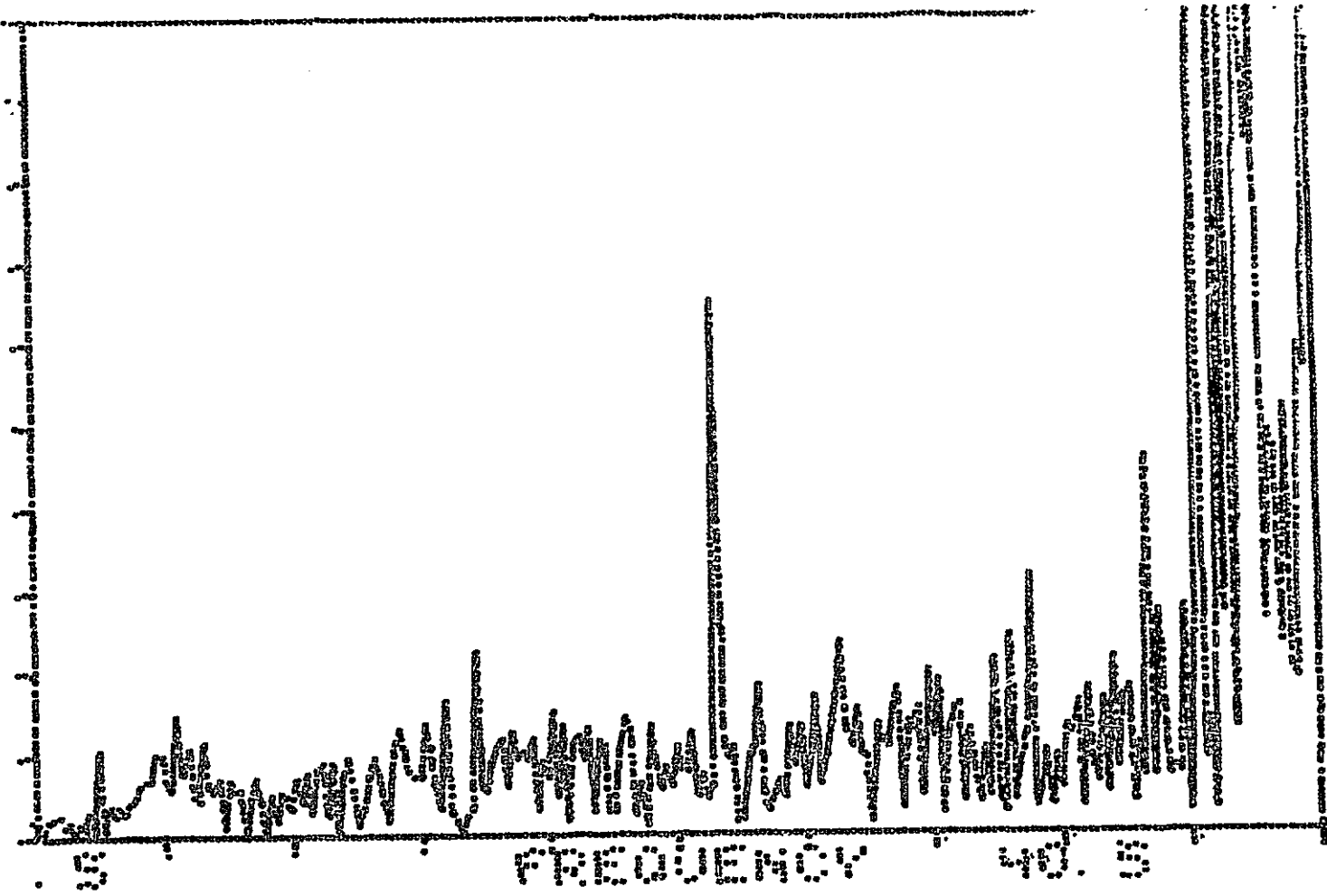
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AV4/FL3



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AV4/FL3

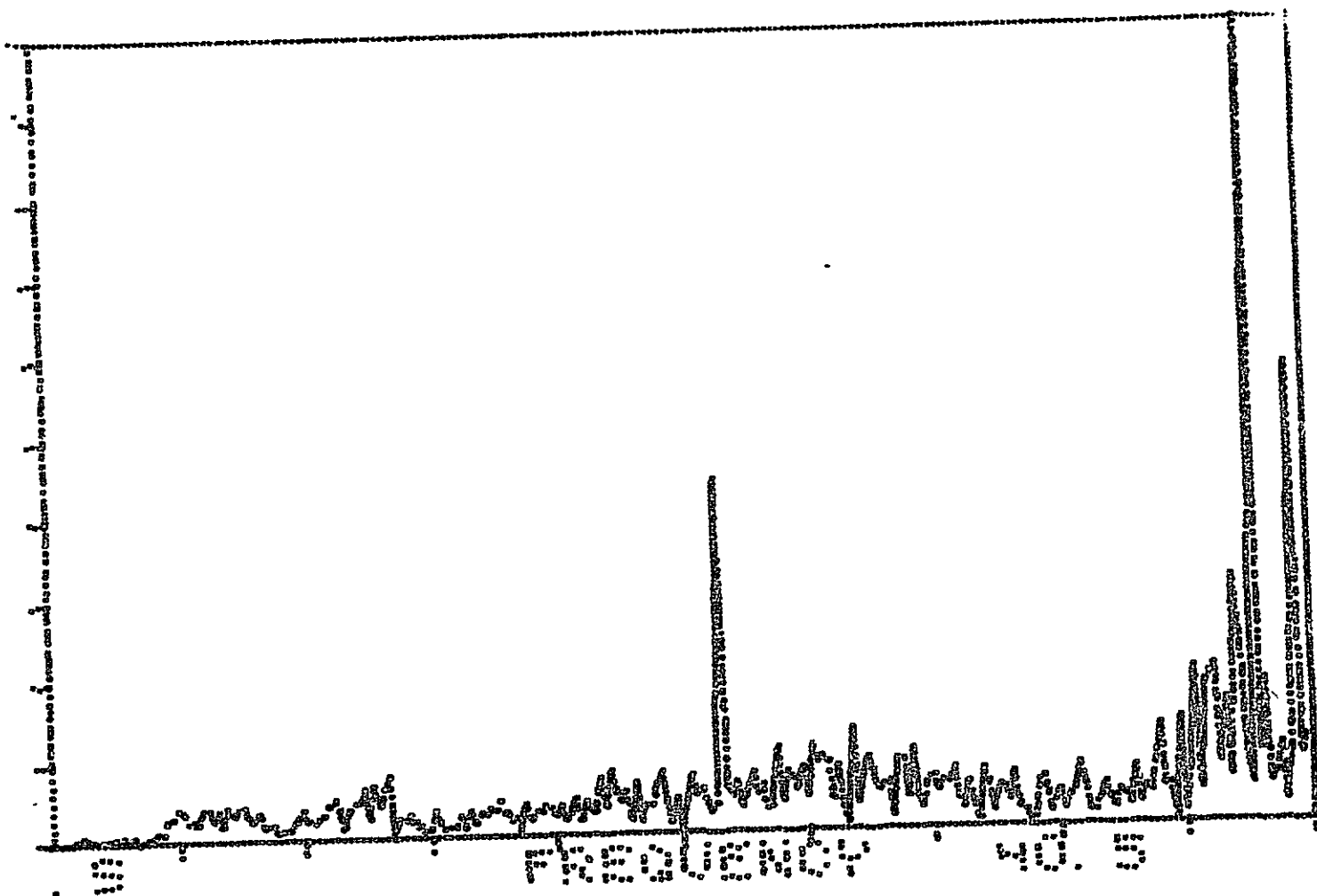
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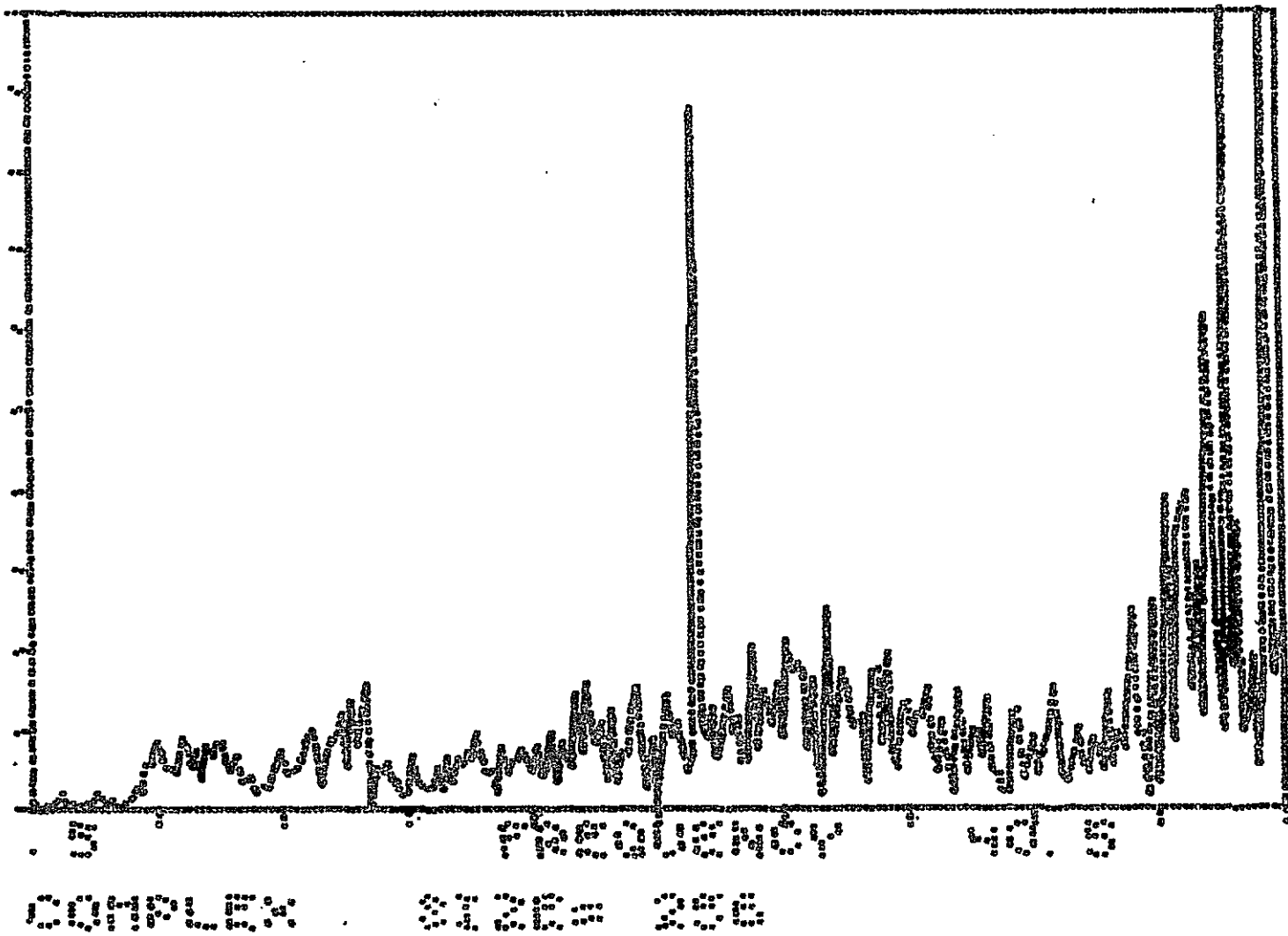
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812E- 256

AV5/FL3

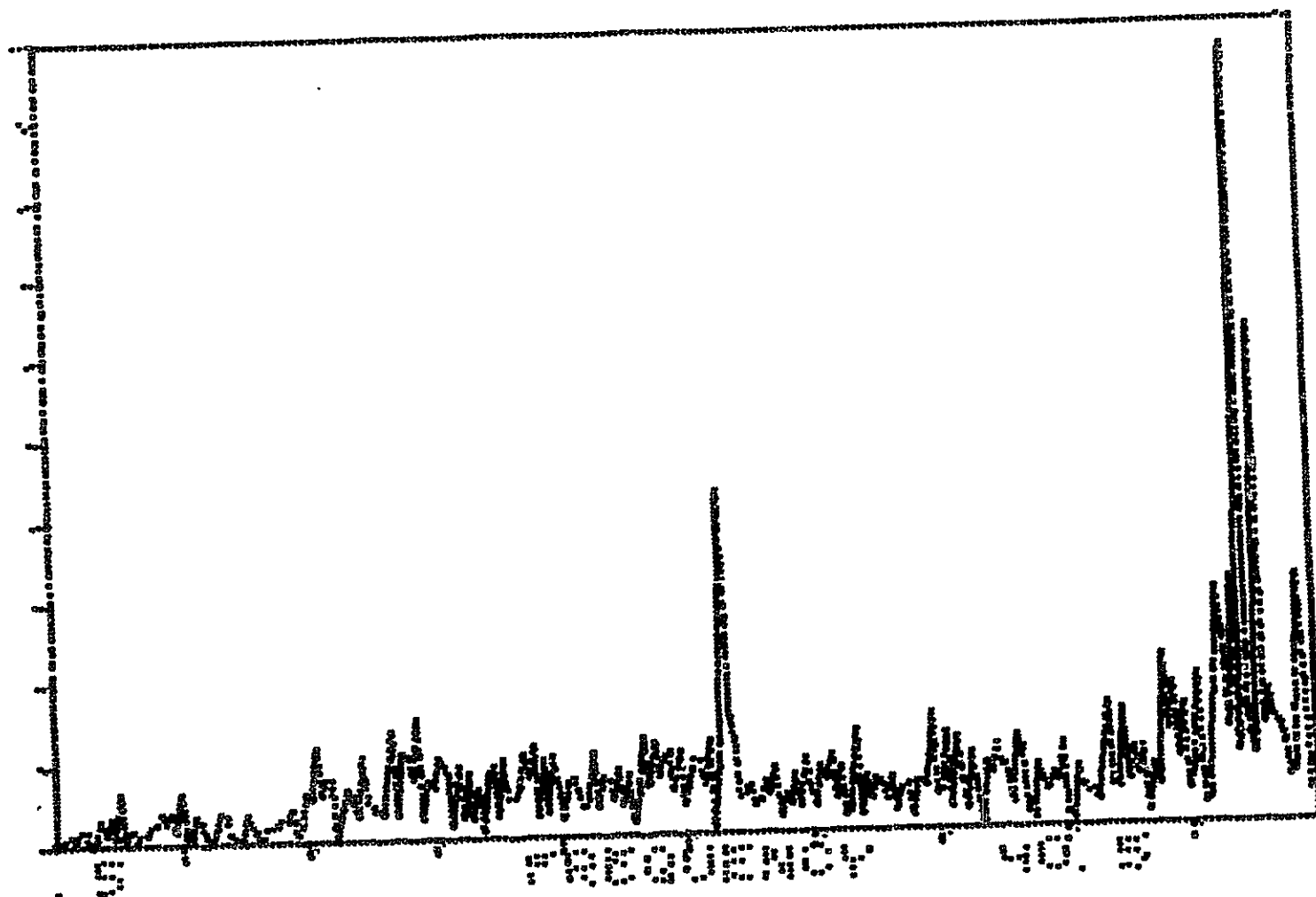


AV5/FL3

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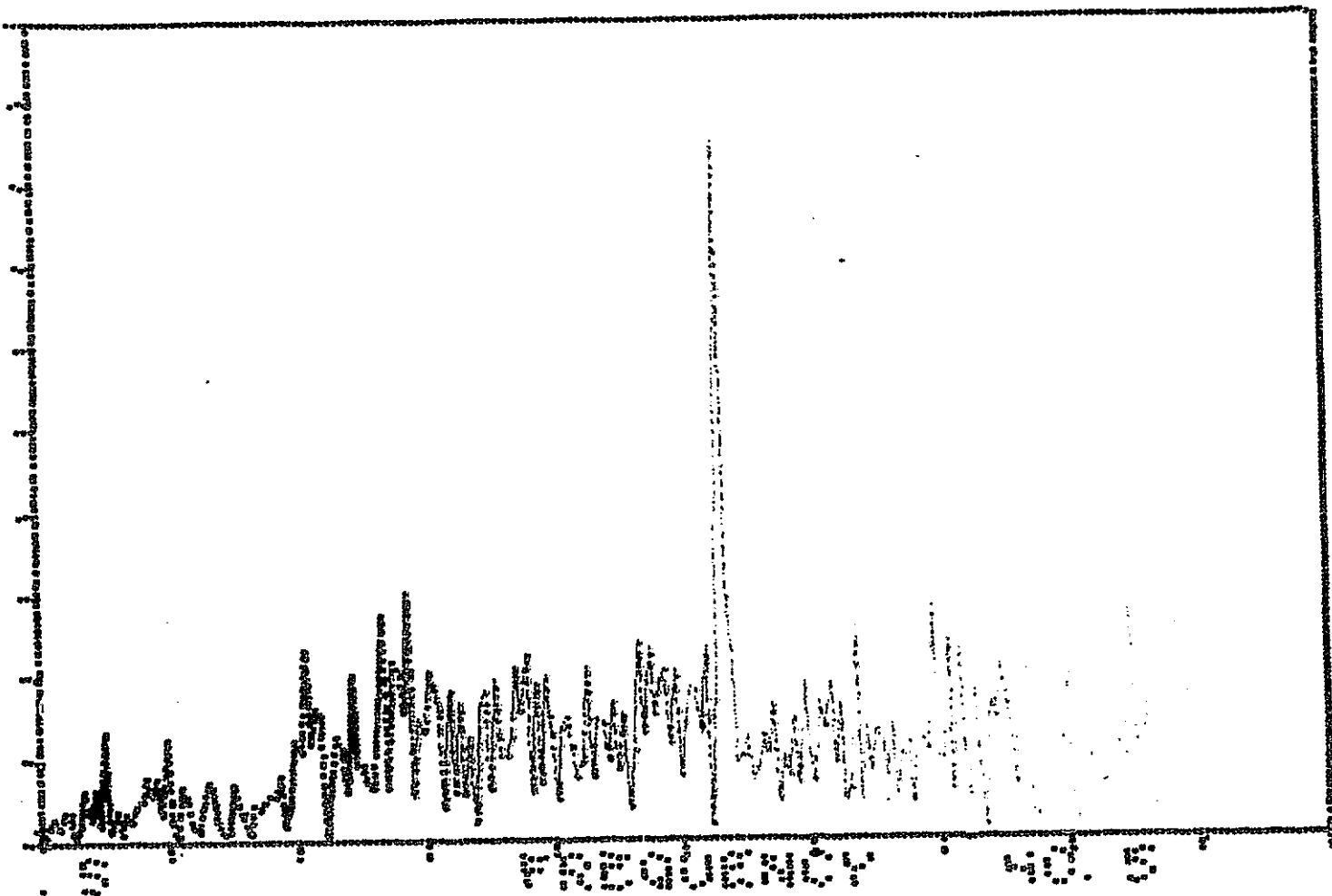
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AV6/FL3



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AV6/FL3

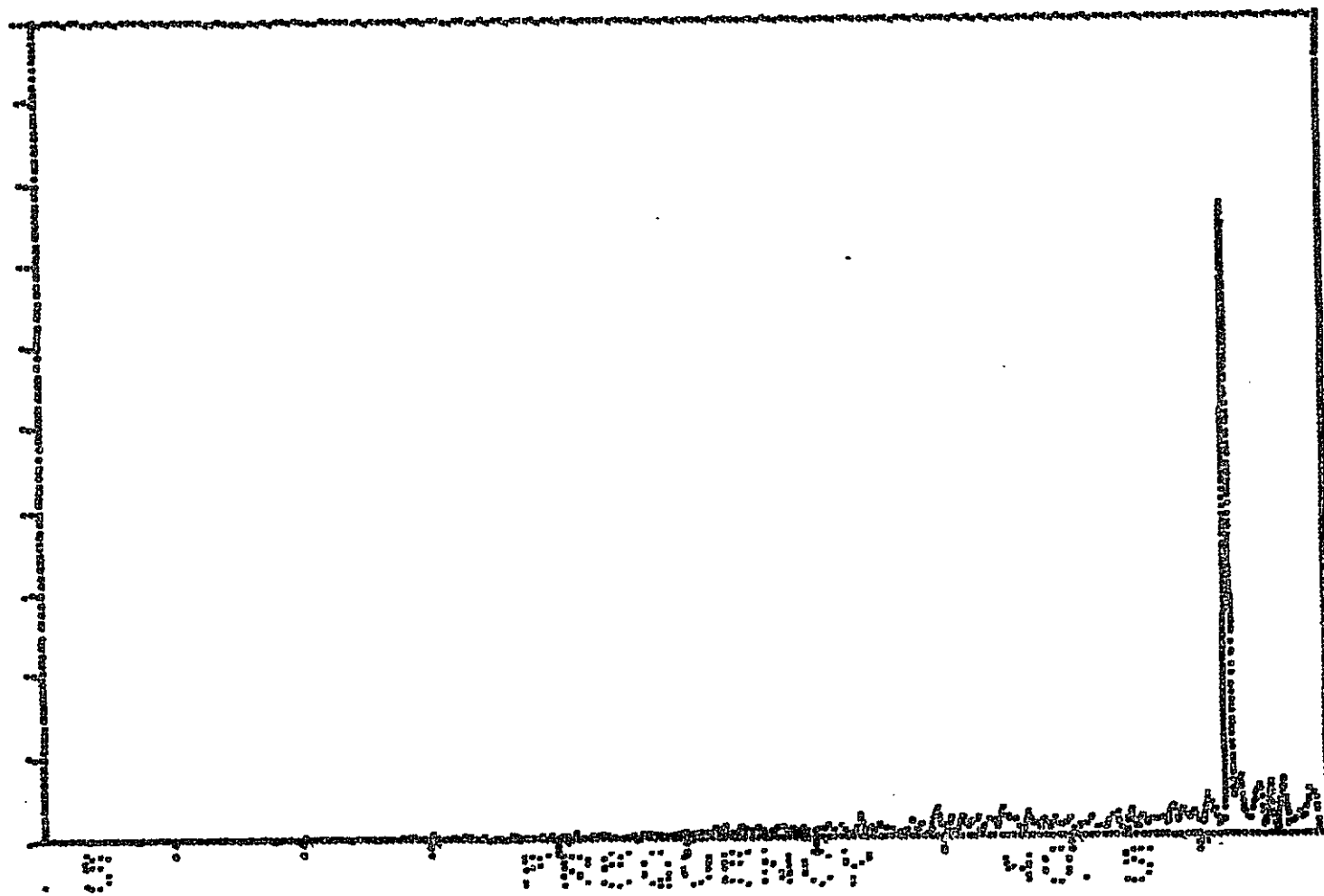
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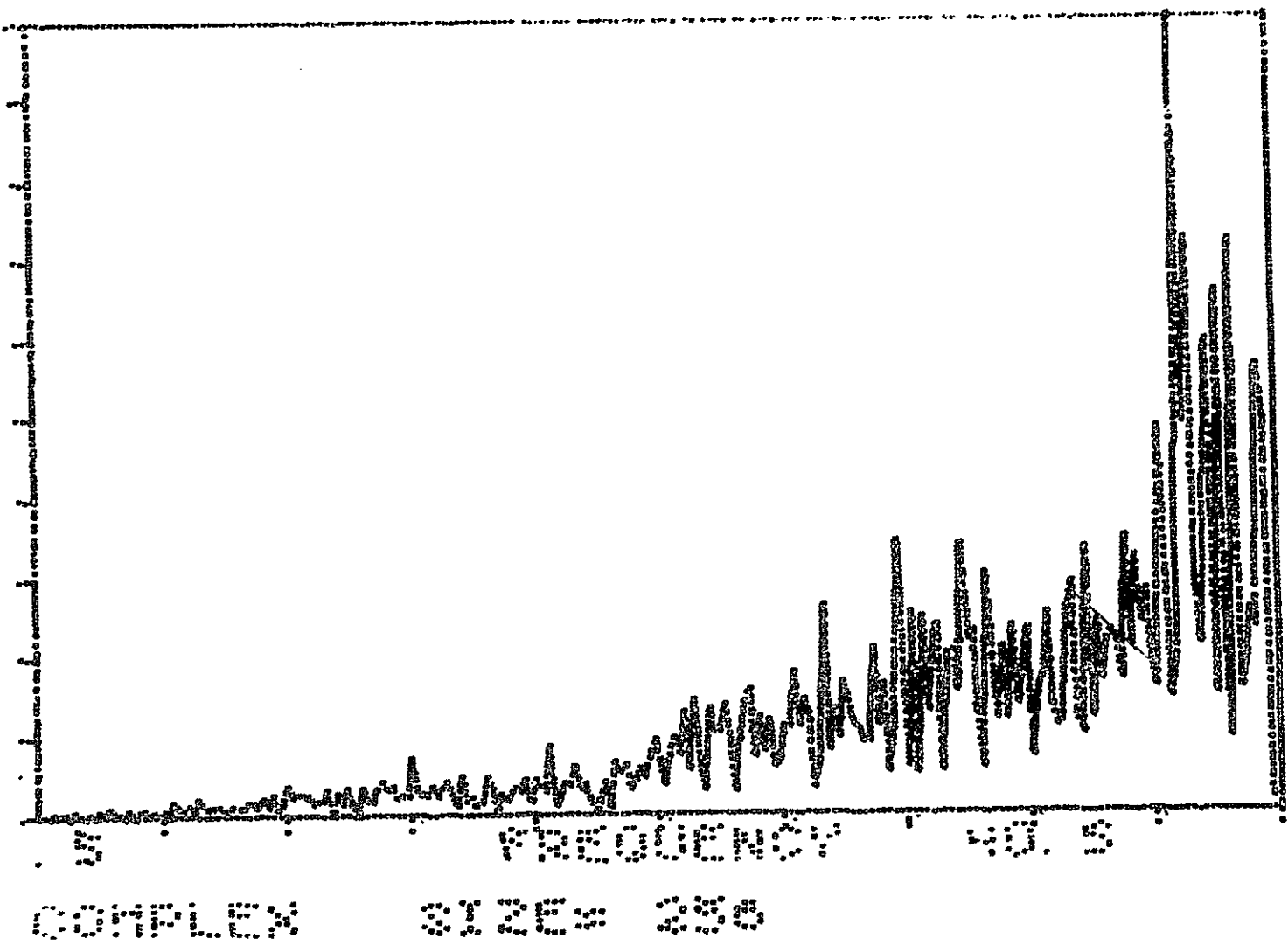
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AL1/FL3



AL1/FL3

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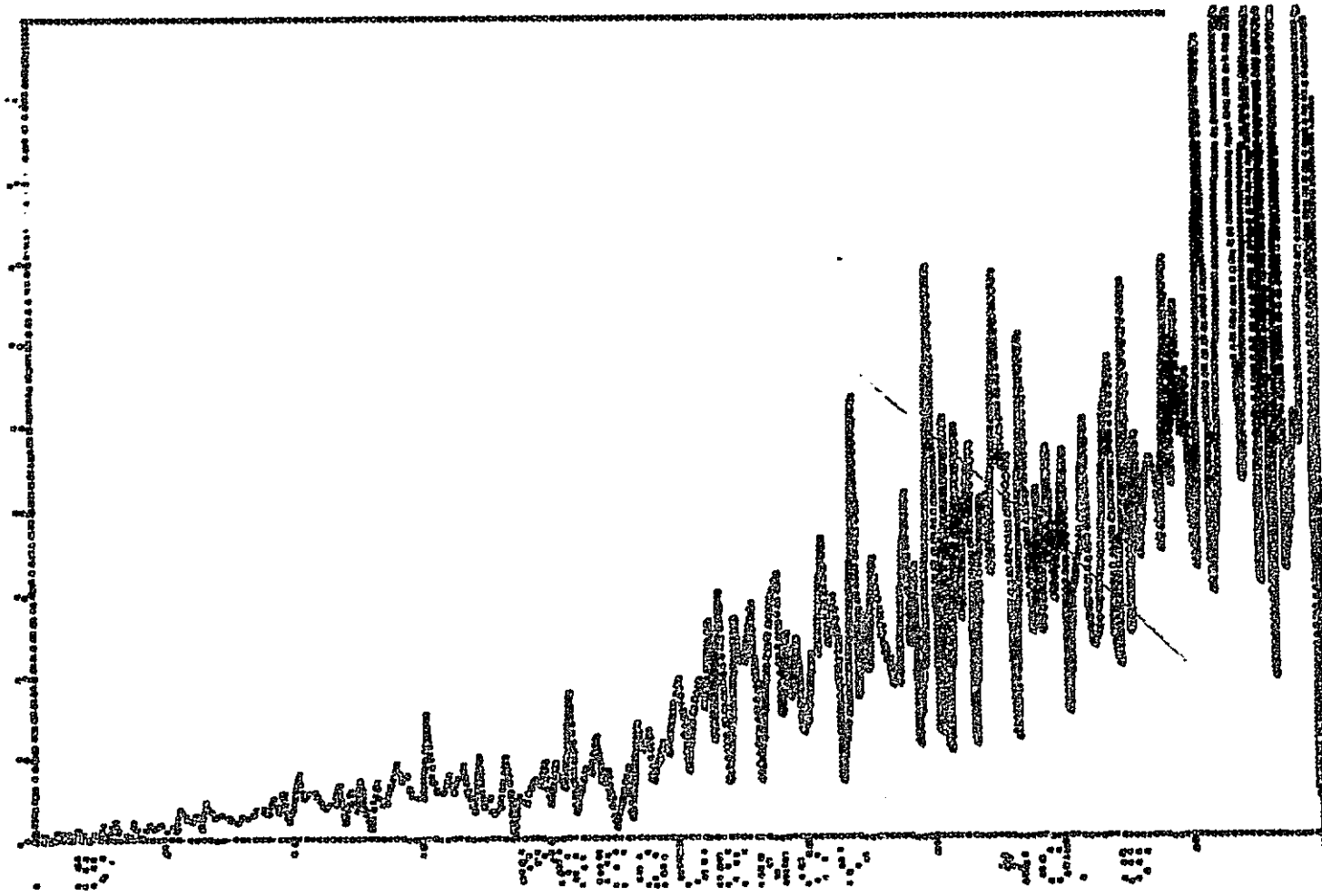
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COMPLEX

2128x 256

AL1/FL3

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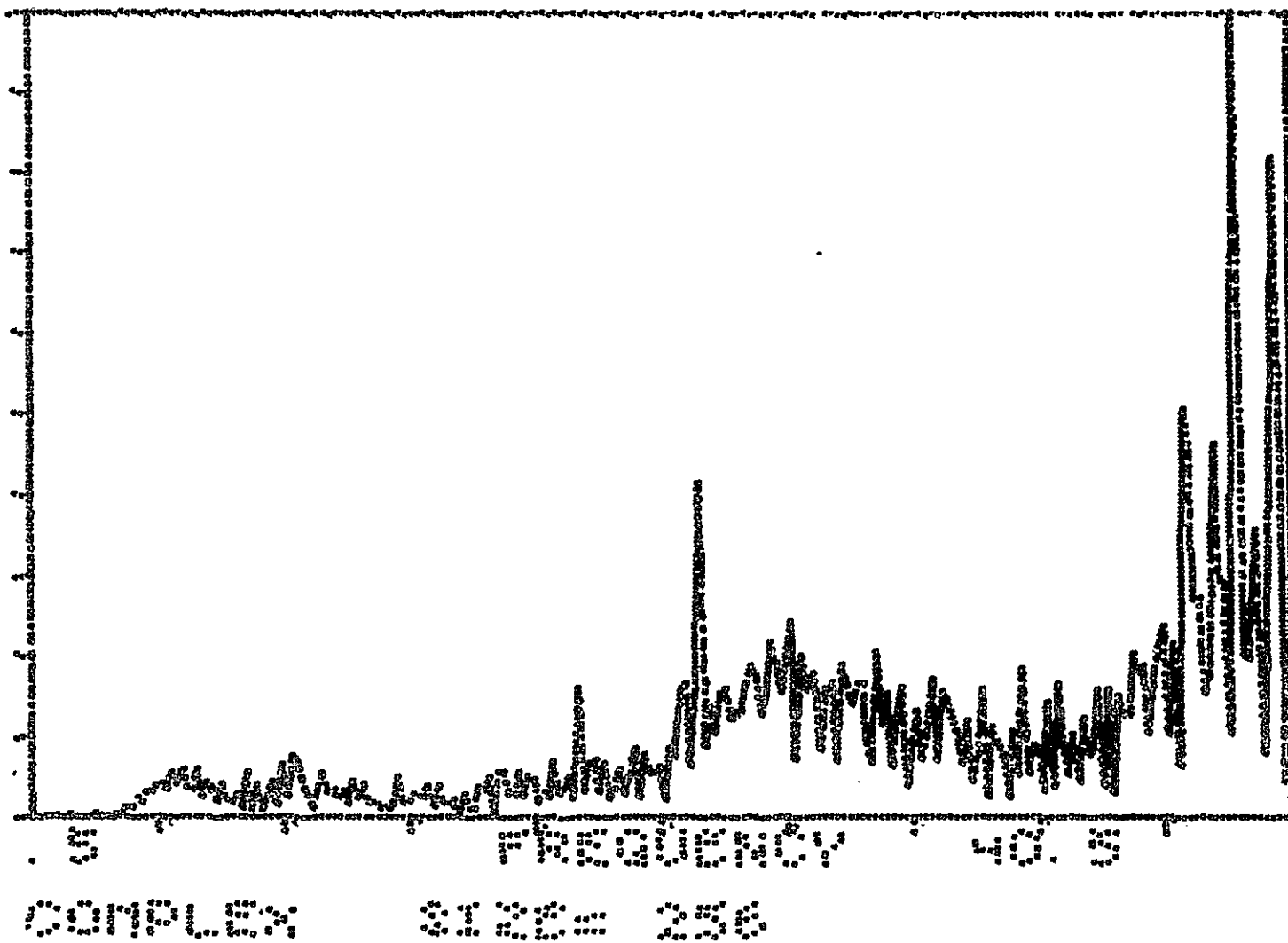


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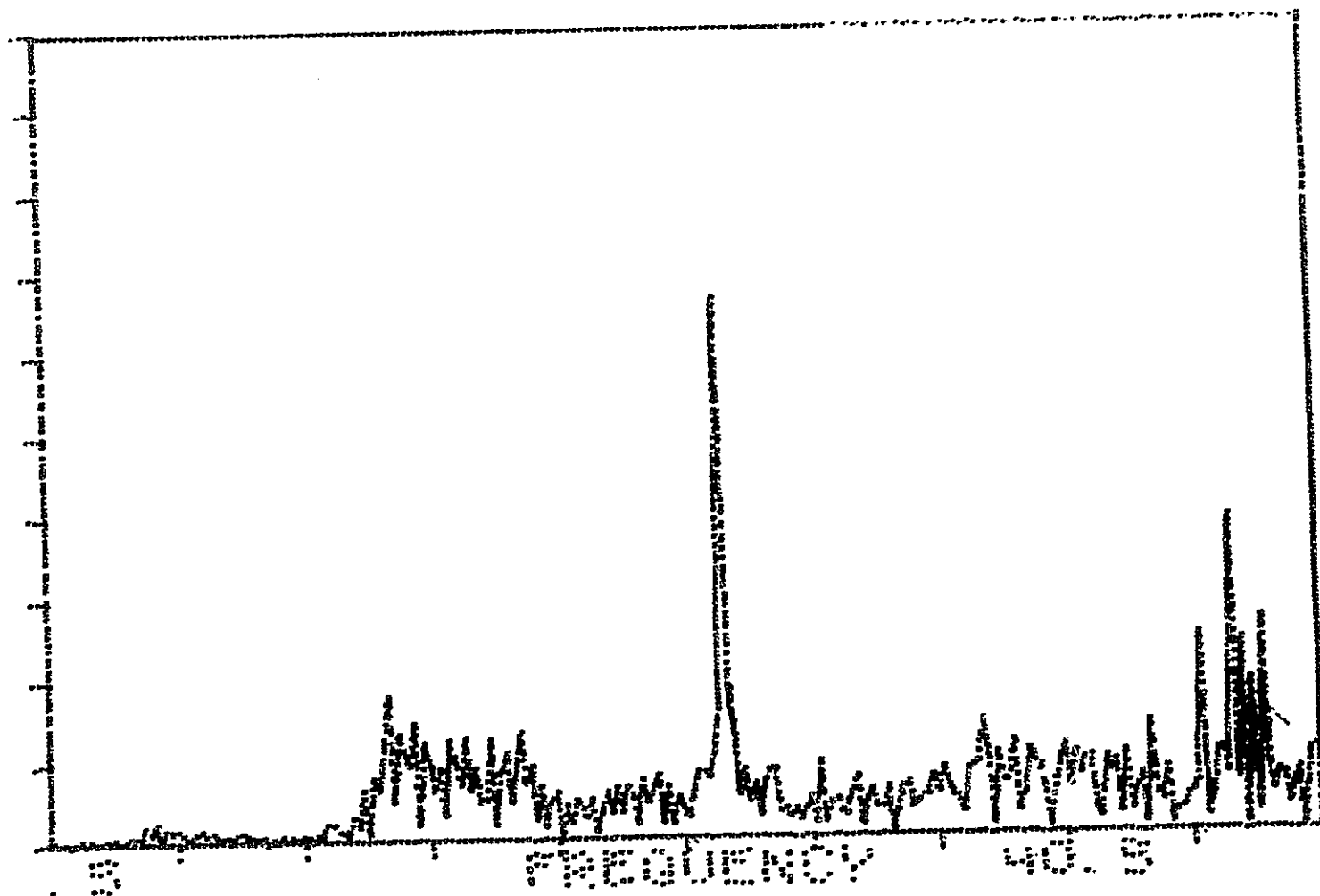
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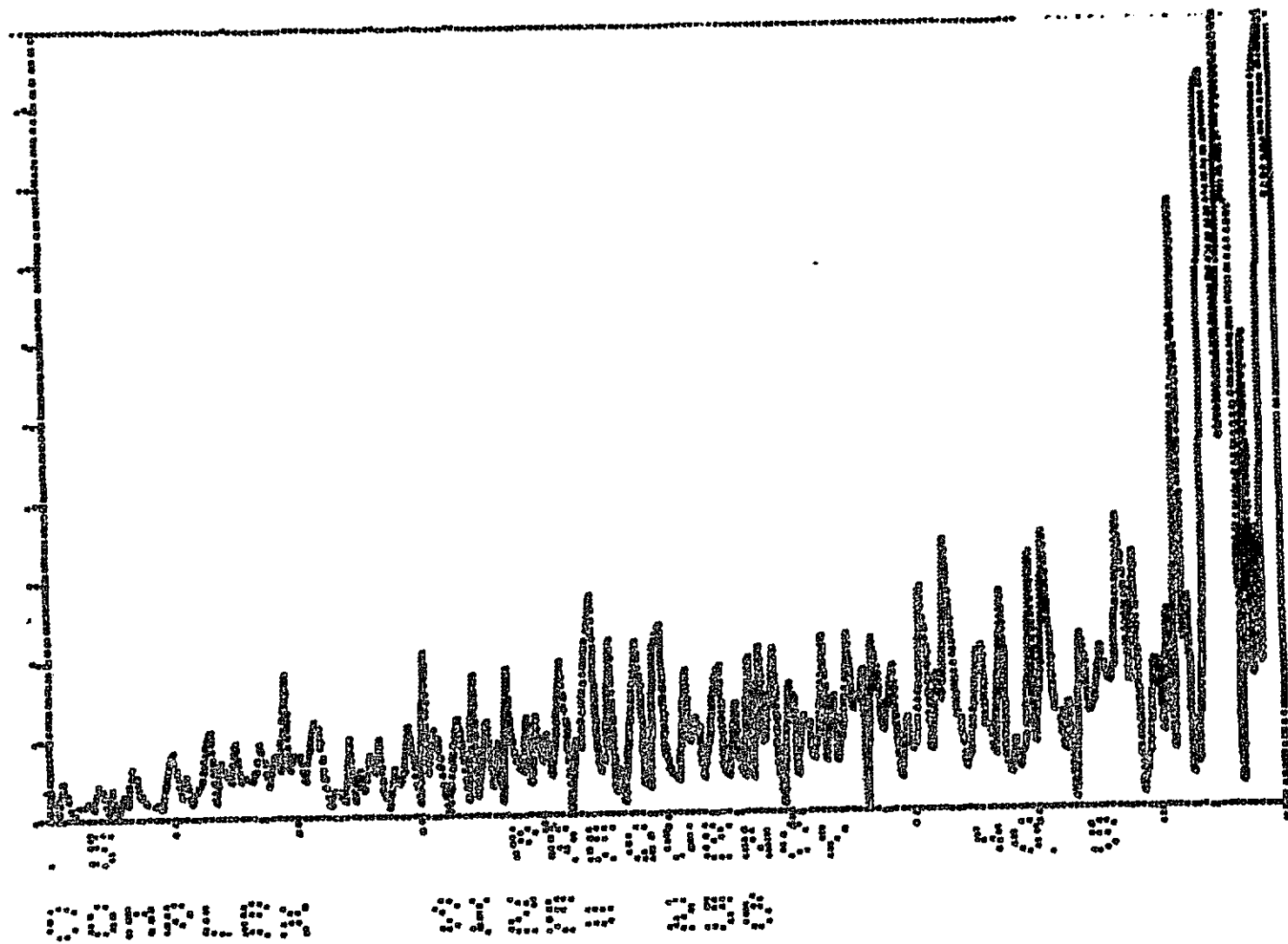
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AL3/FL3



AL6/FL3

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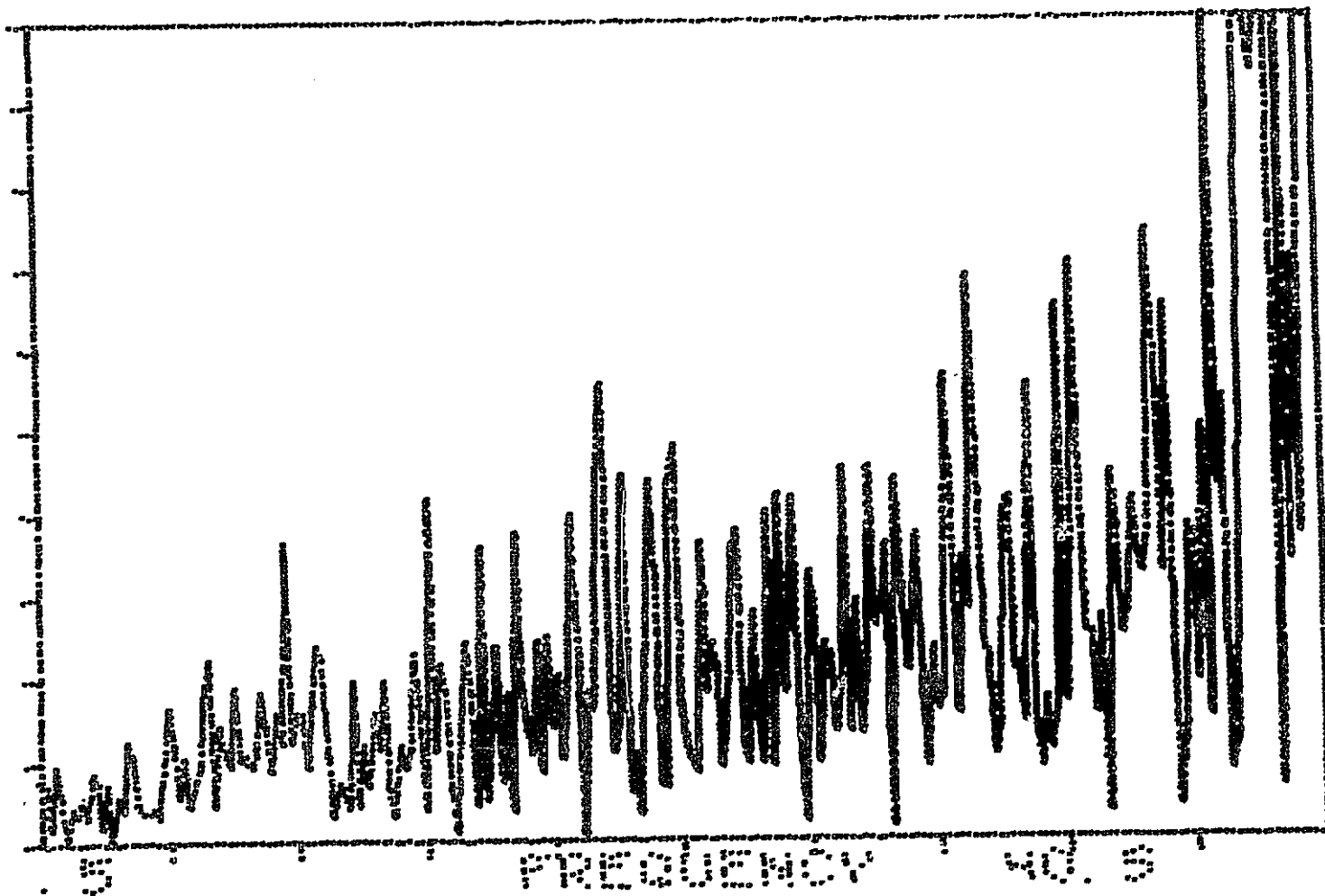
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COMPLEX

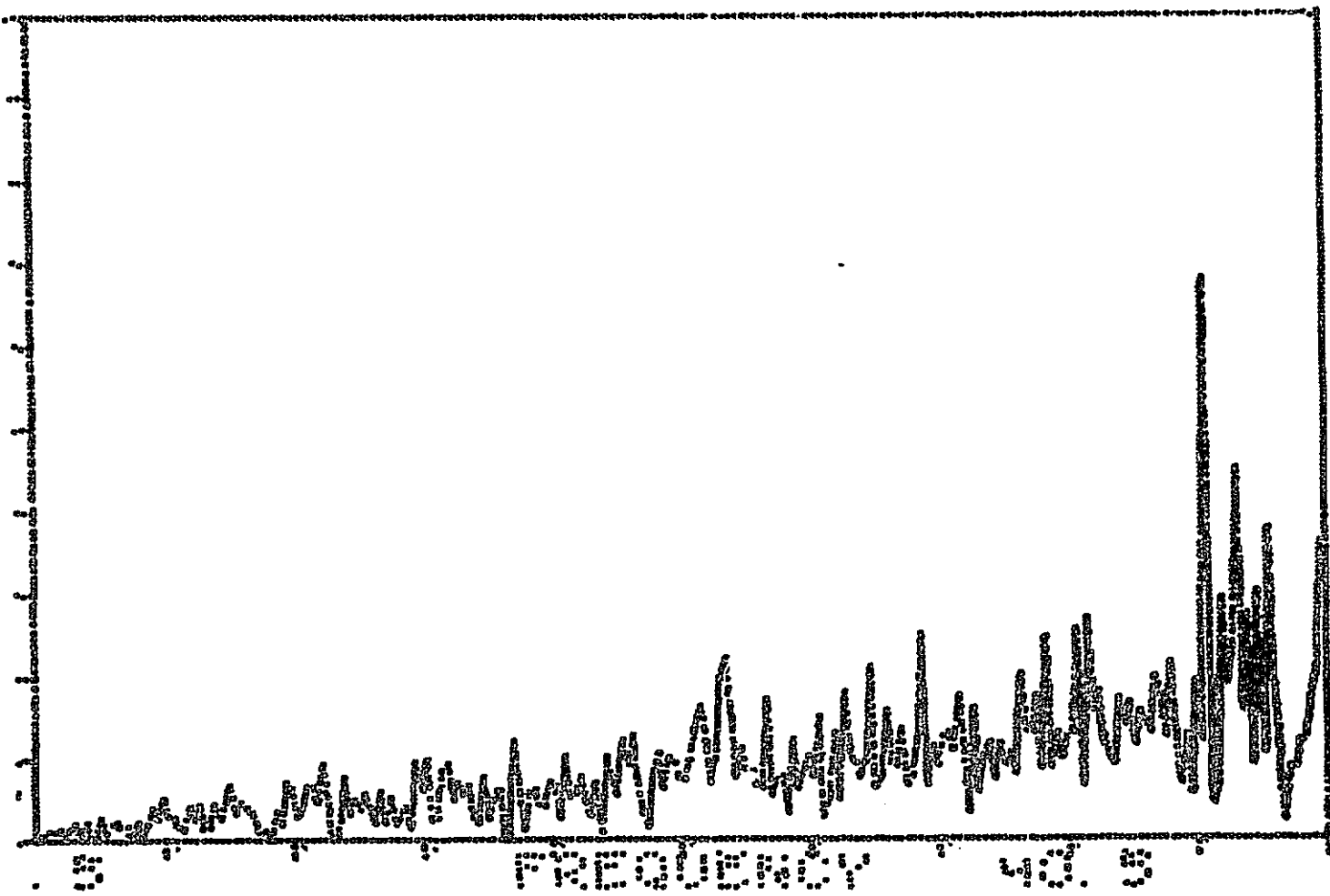
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AL6/FL3

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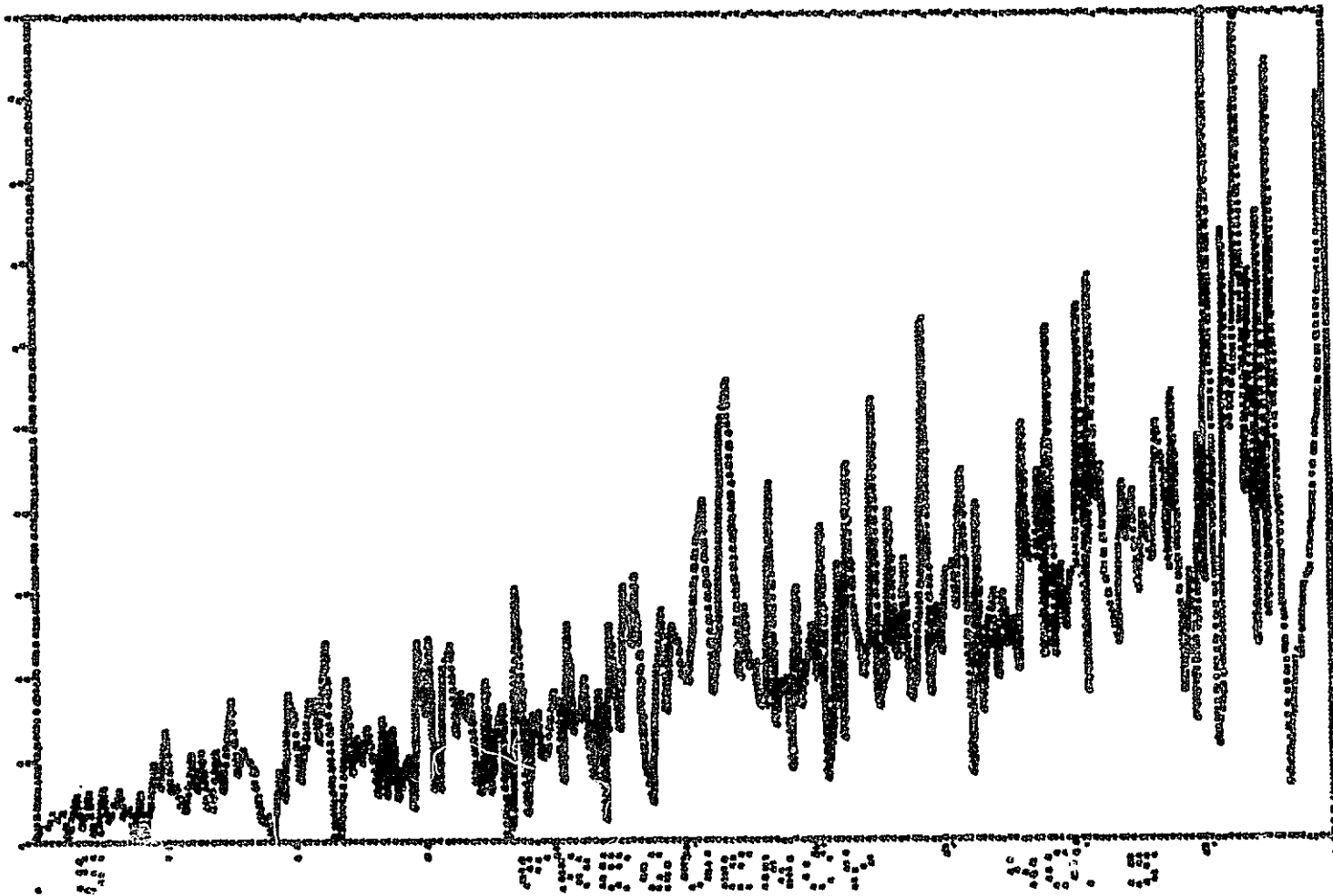
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AL7/FL3



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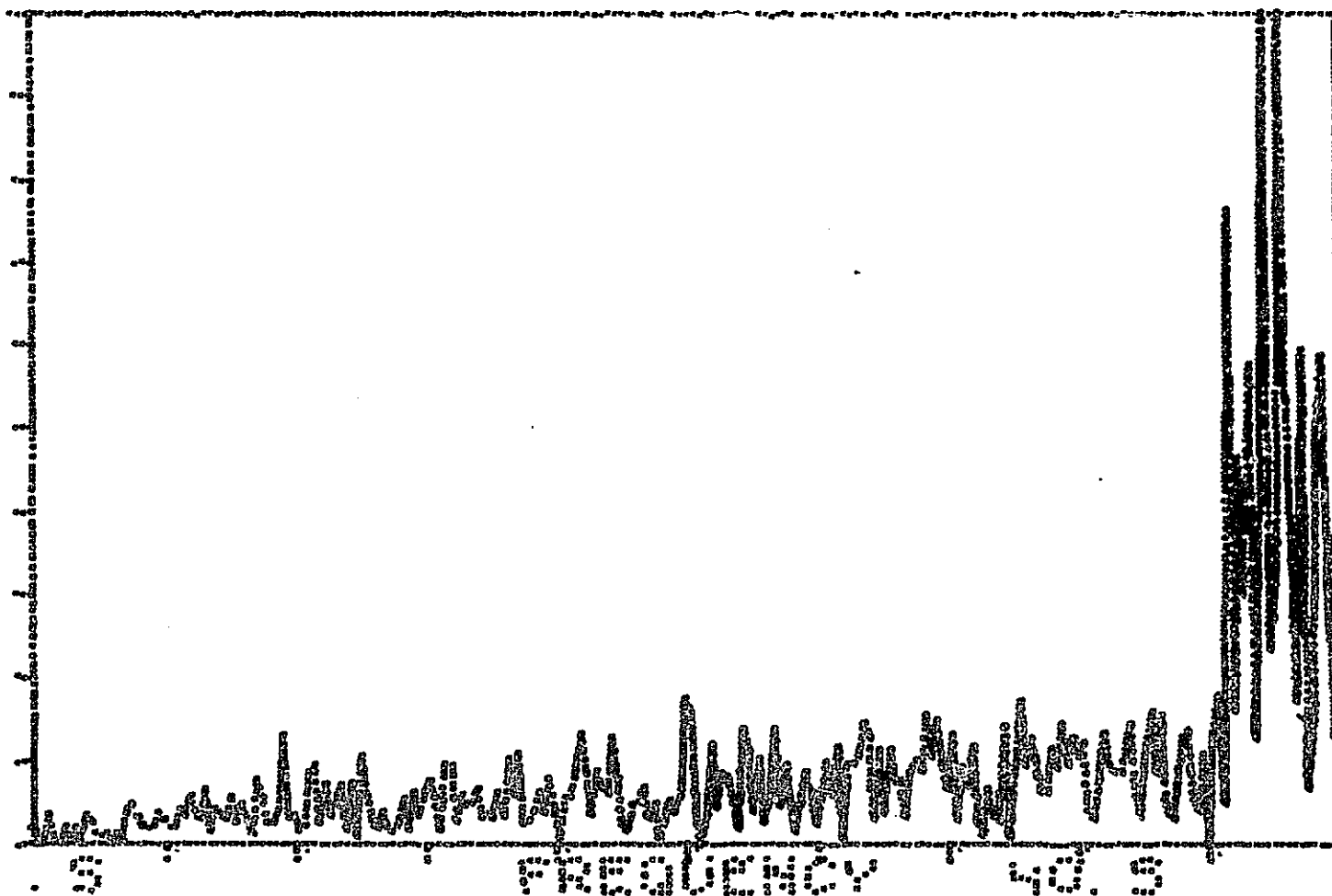
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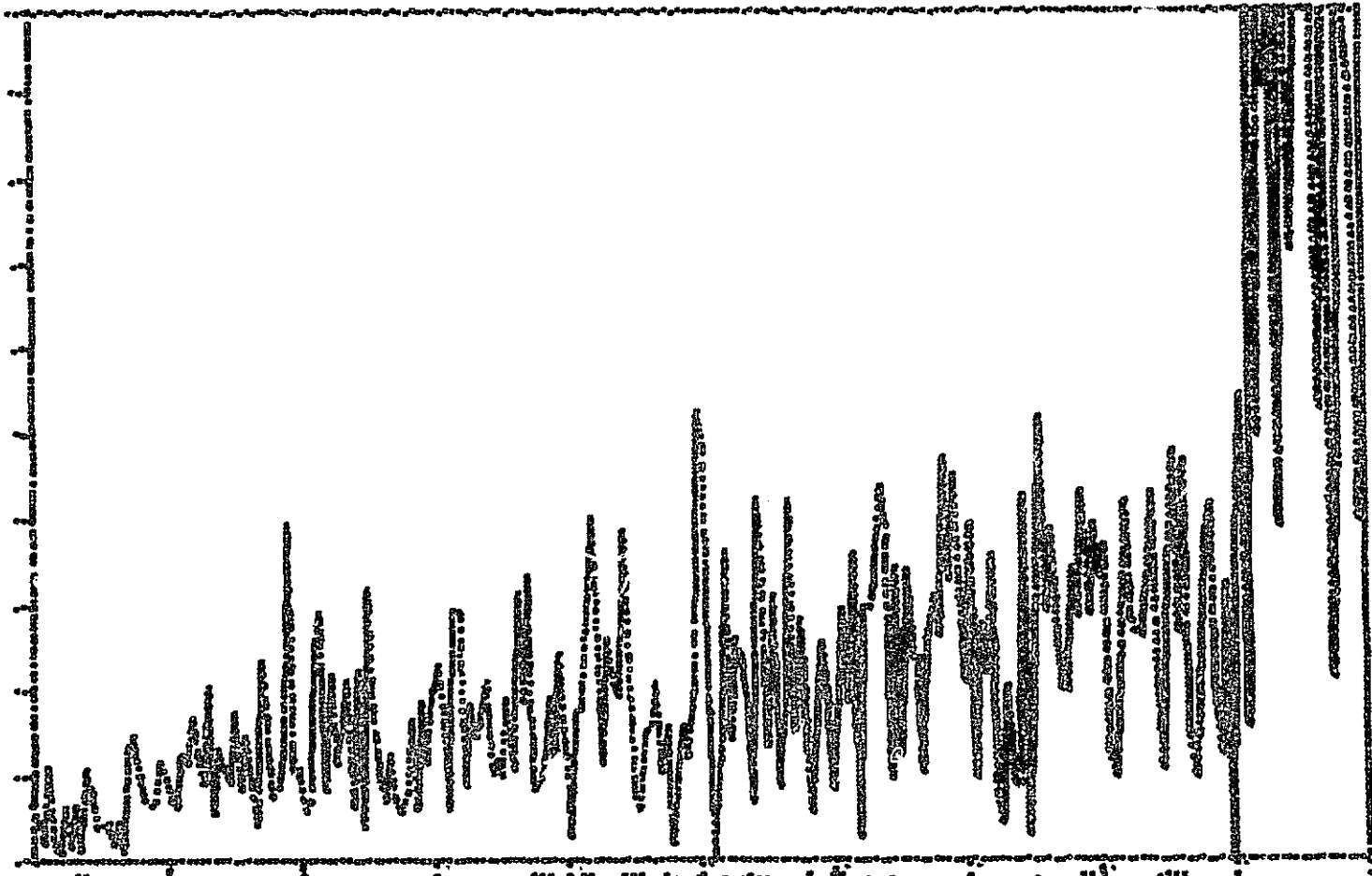
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complex

size: 255

AL11/FL3



COMPLEX 0122-255

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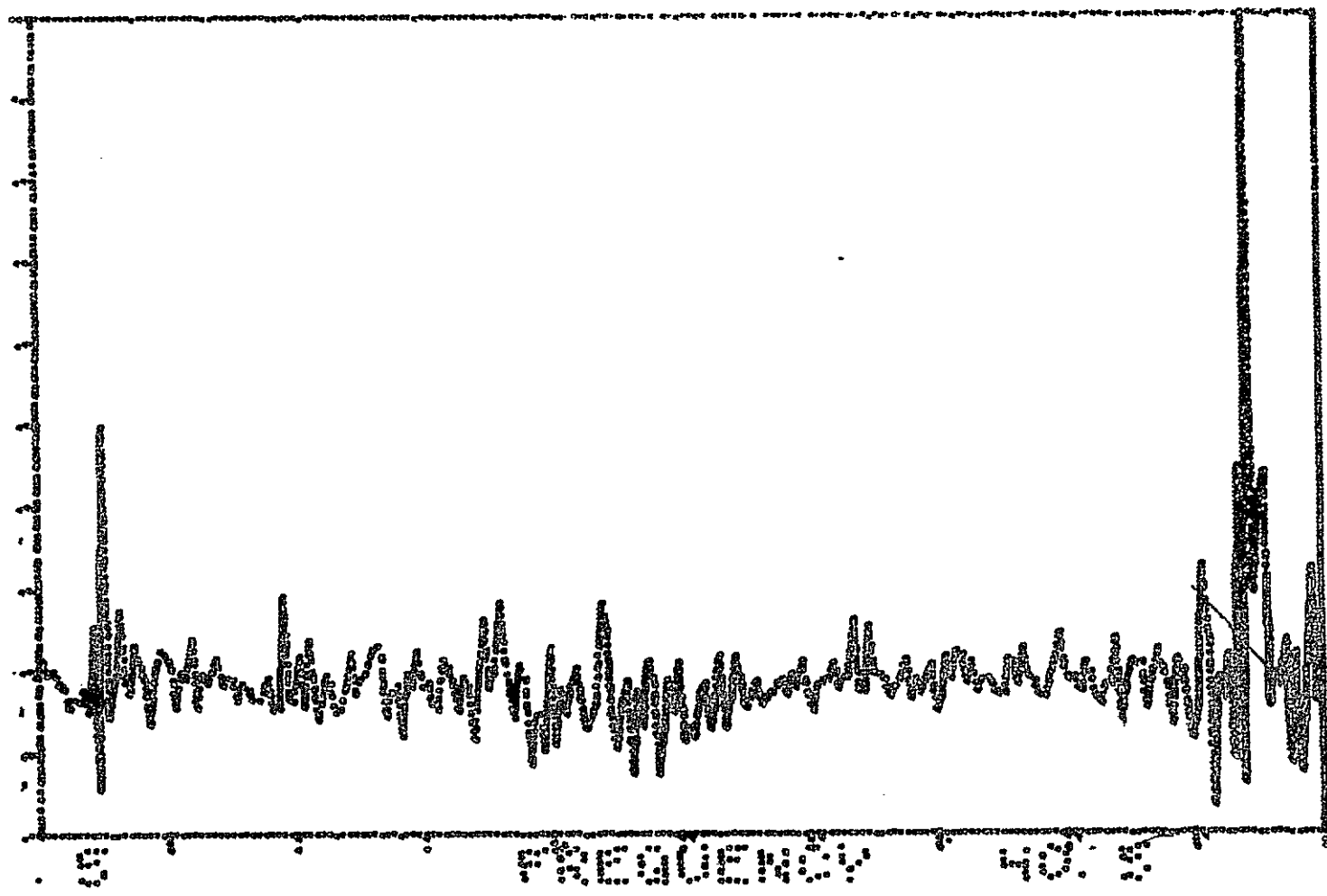
1994

0

g.

1988

a.



COMPLEX

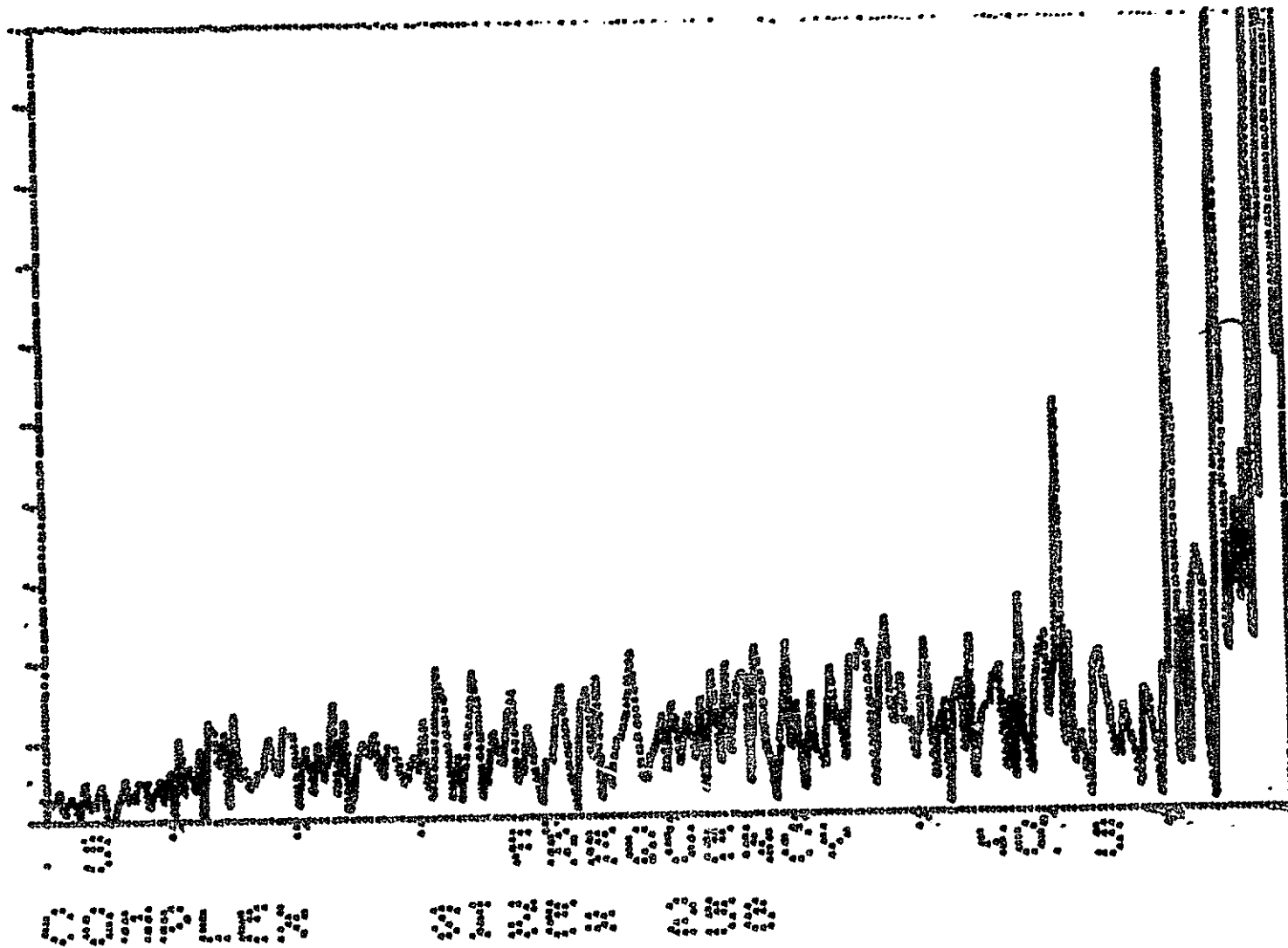
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1903

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AL4/FL3

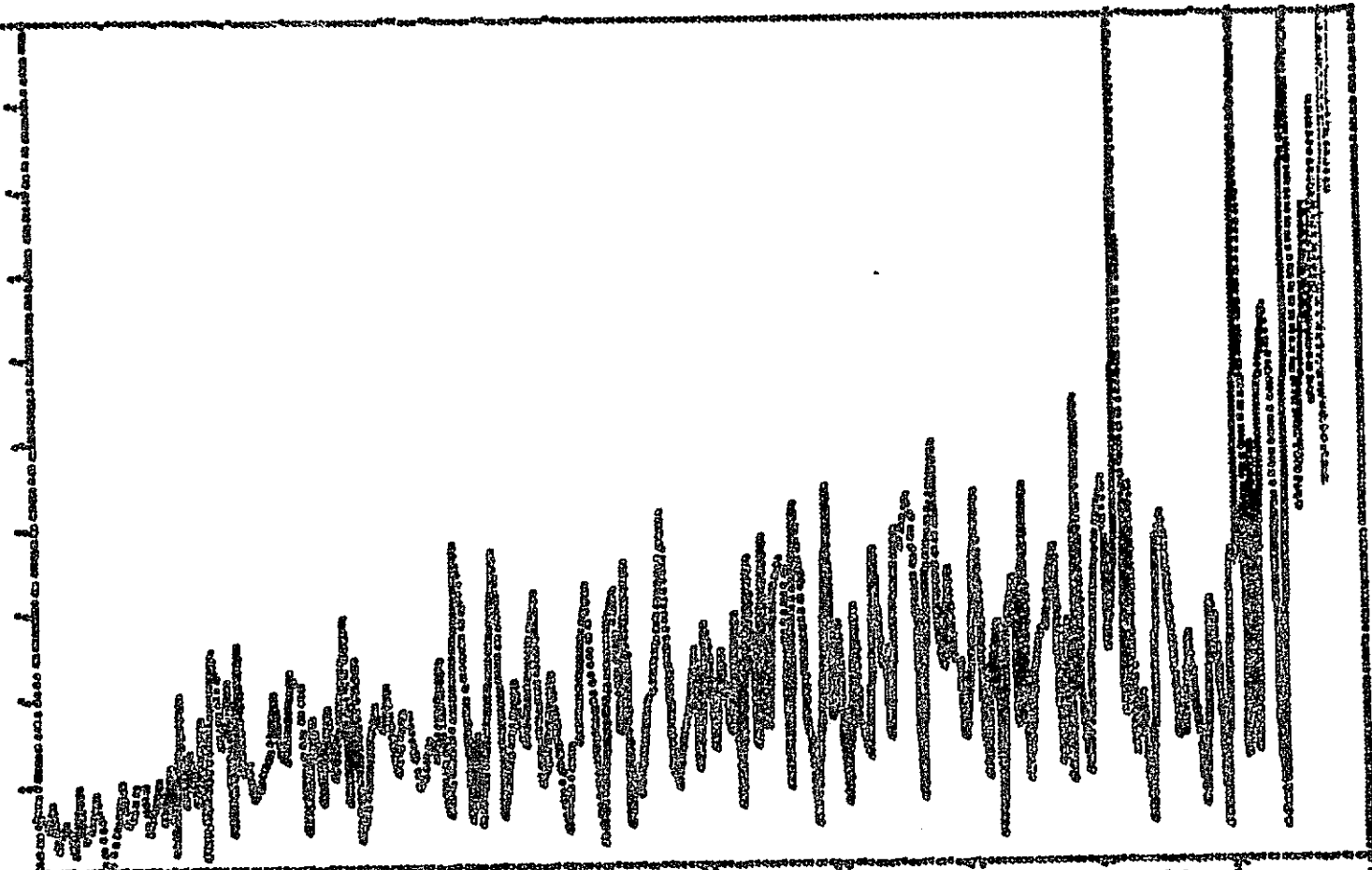
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AL4/FL3

01227 253

01227 253



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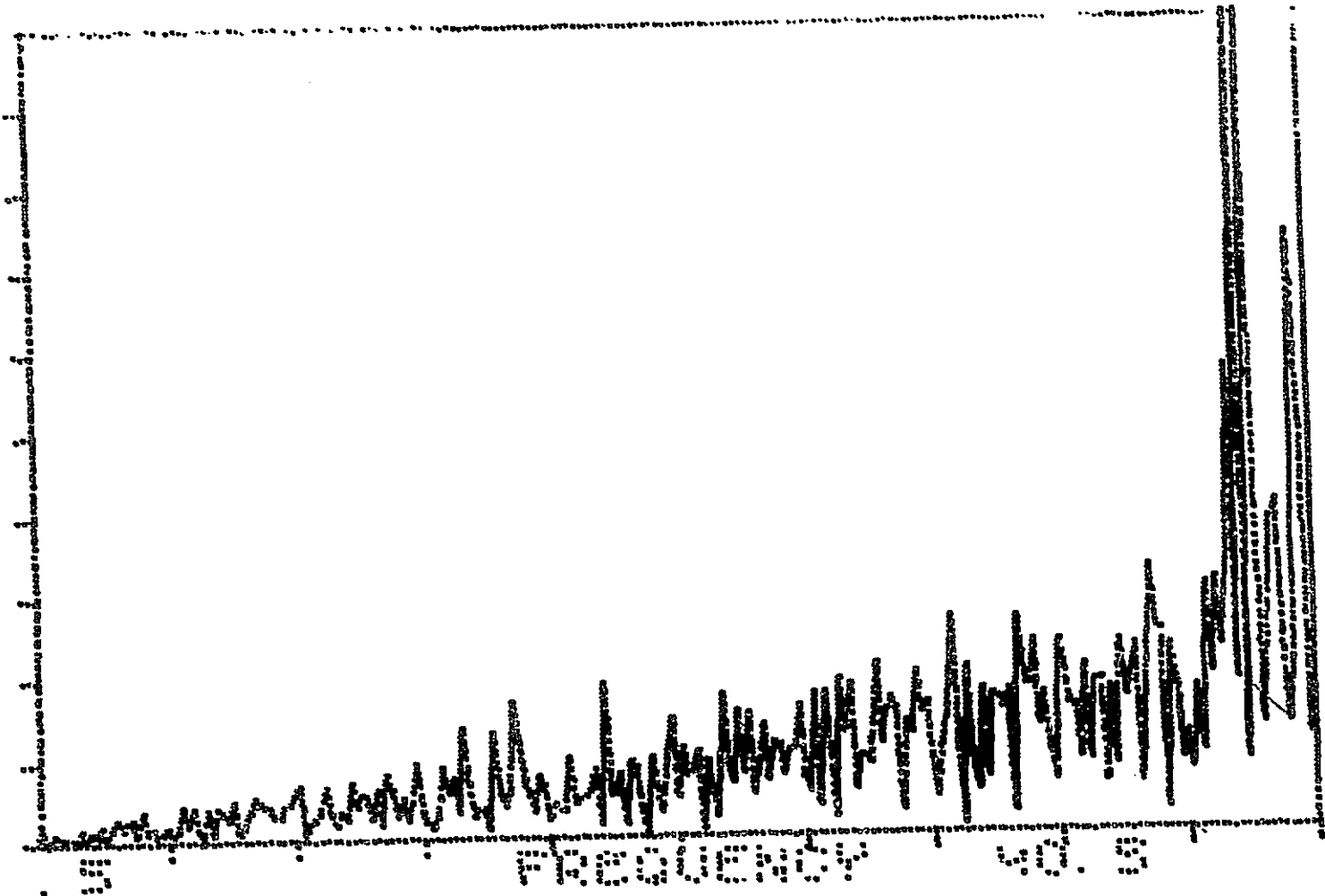
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max

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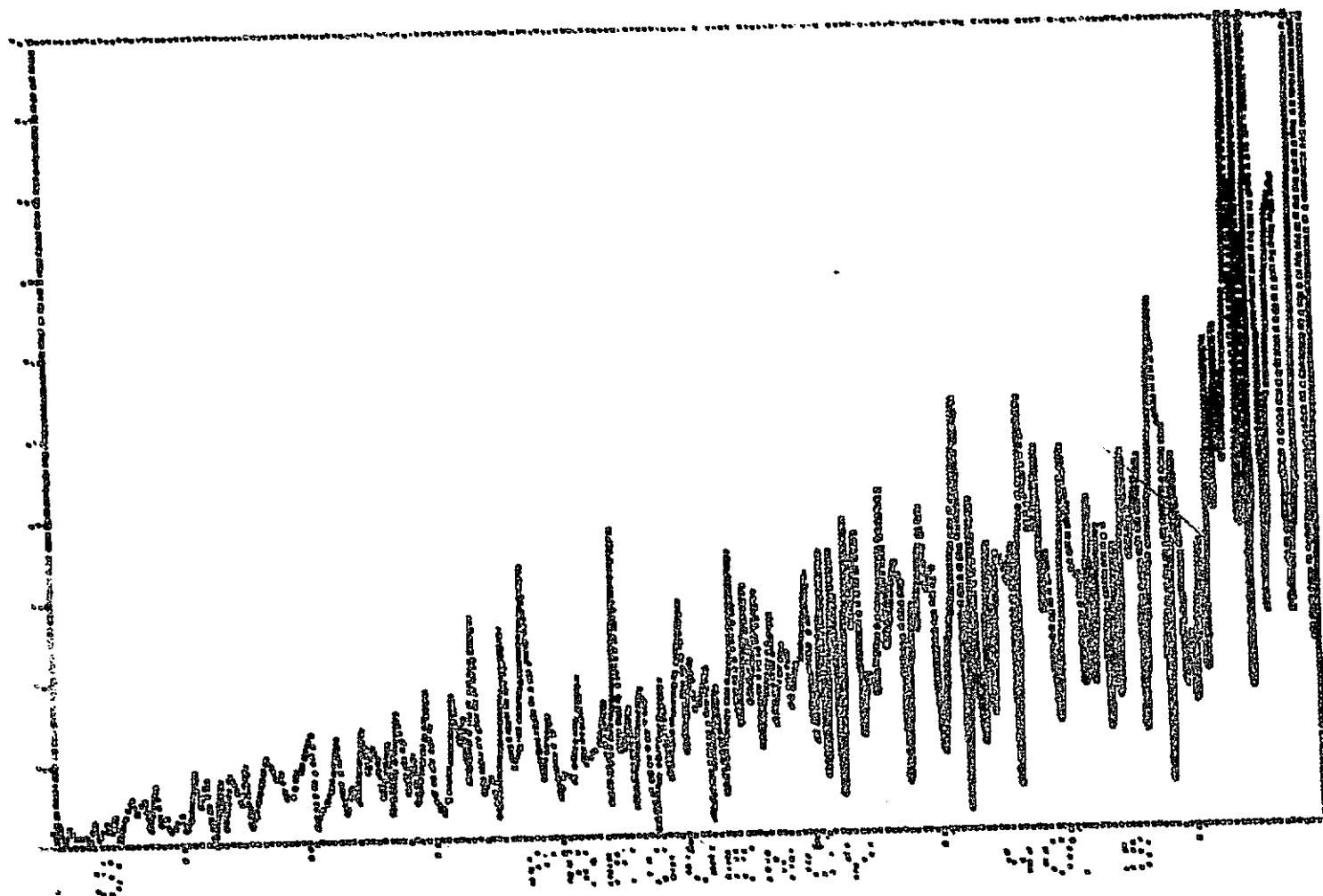
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COMPLEX

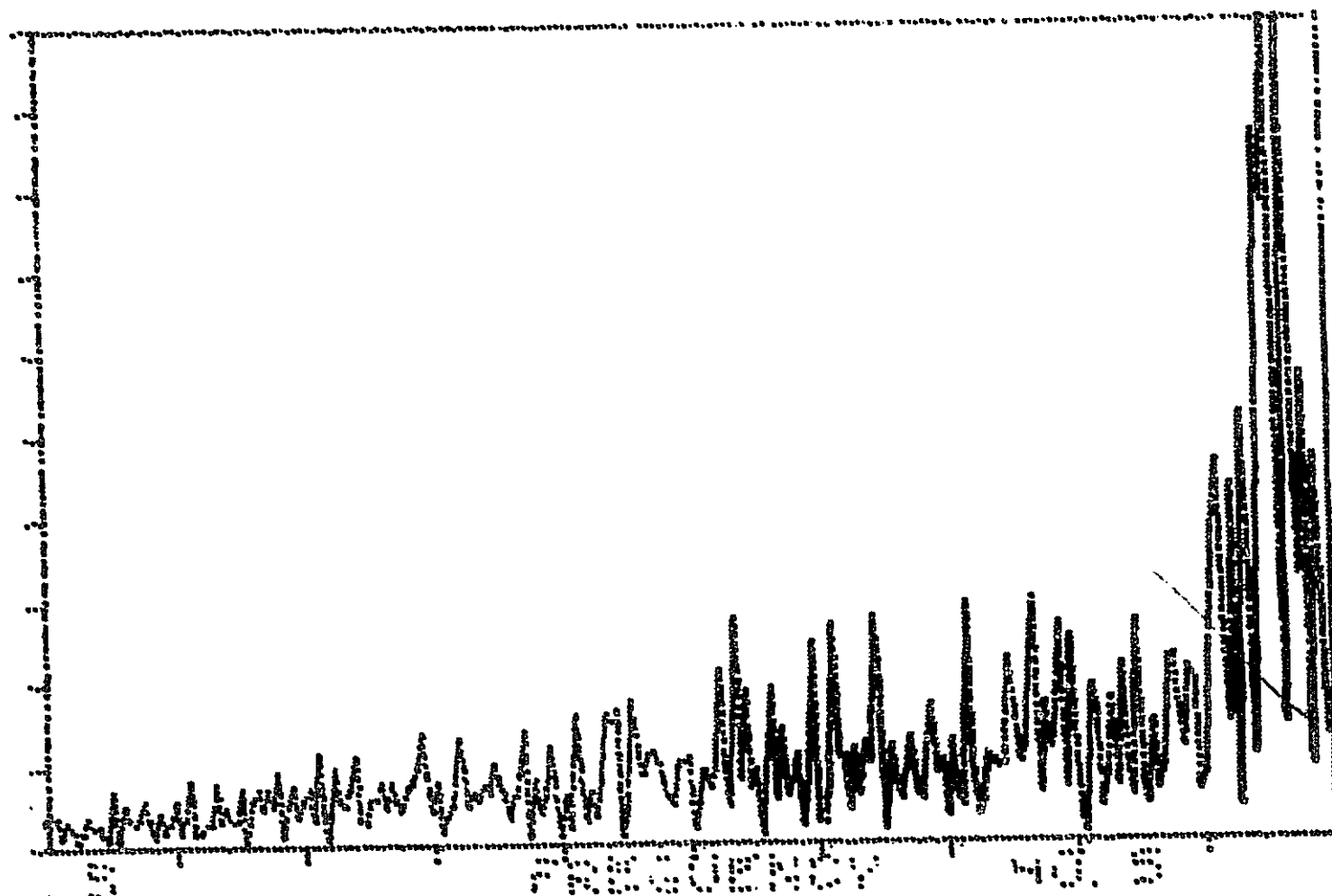
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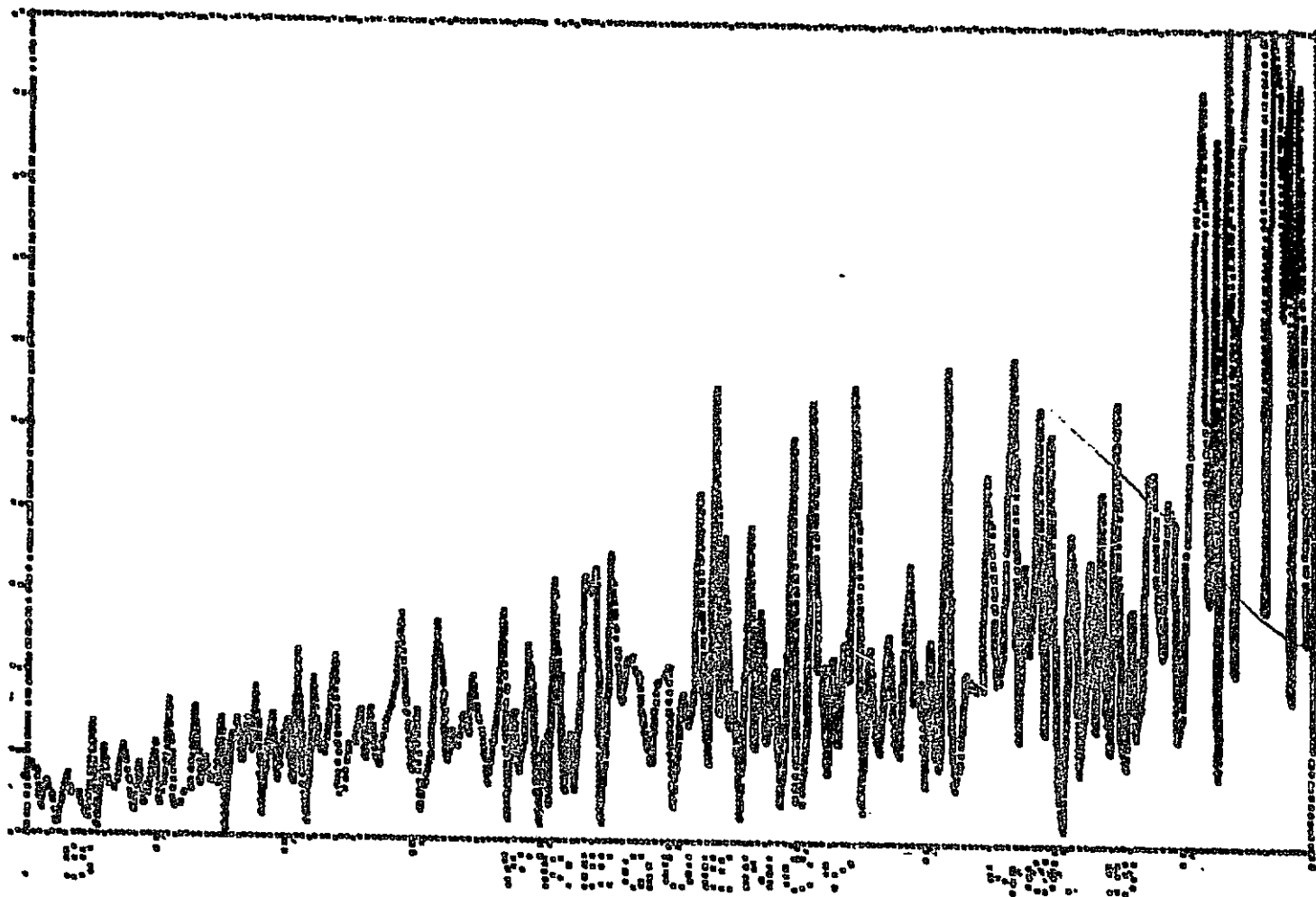
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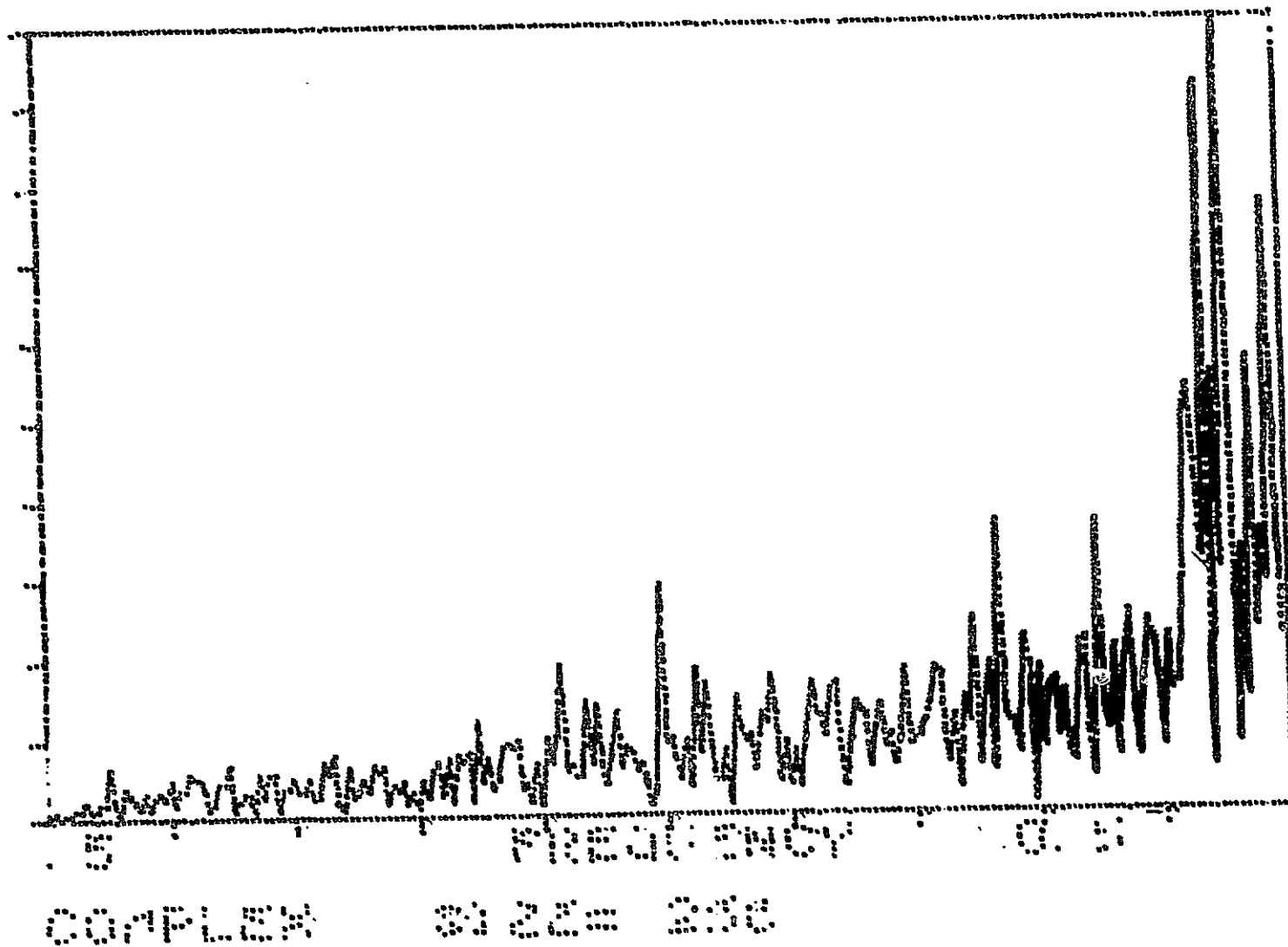
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1994

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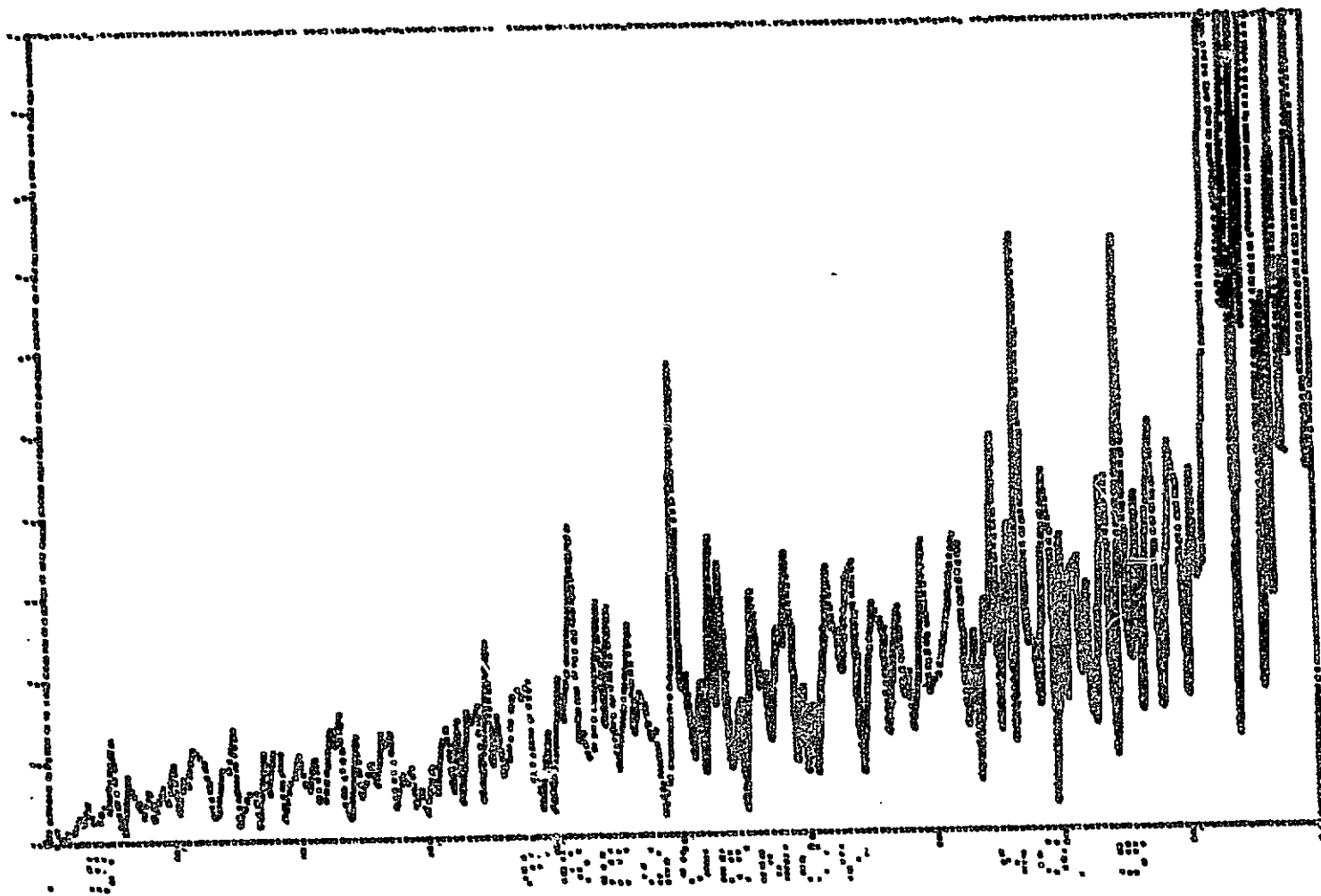


AL9/FL3

00.

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0.



COMPLEX

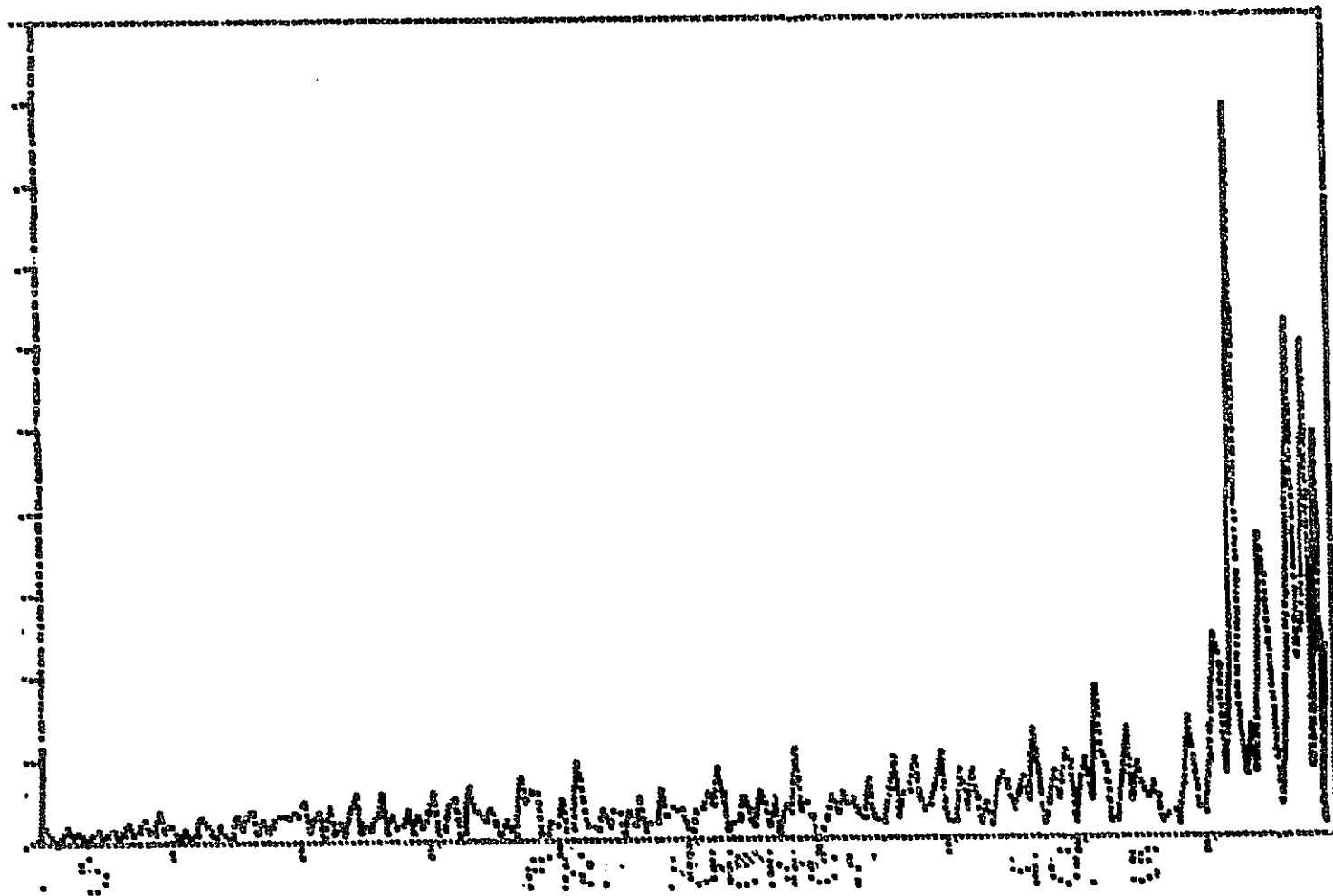
SIZE = 250

AL9/FL3

50.

1143h

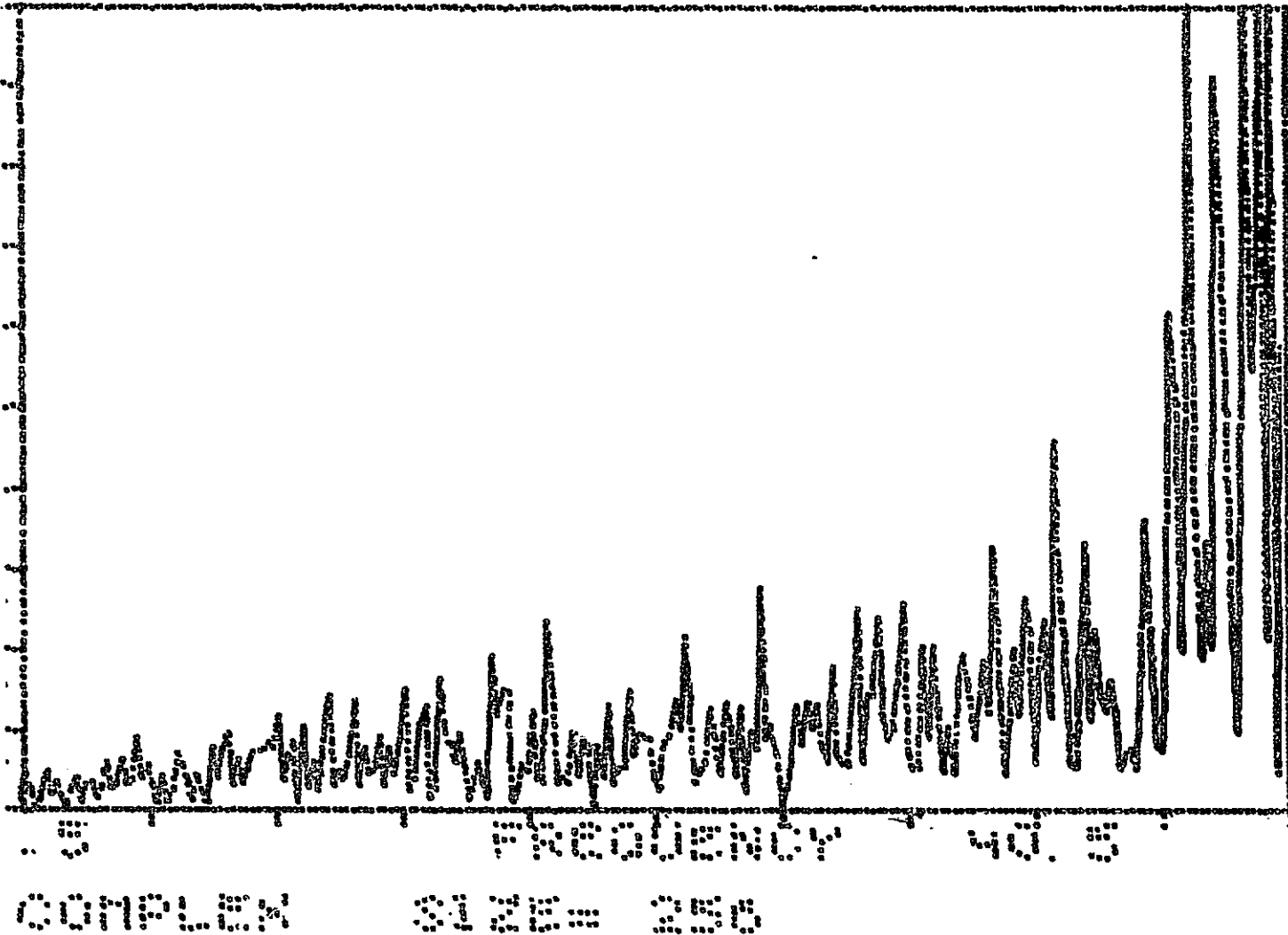
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COMPLEX

SIZE 256

AL10/FL3

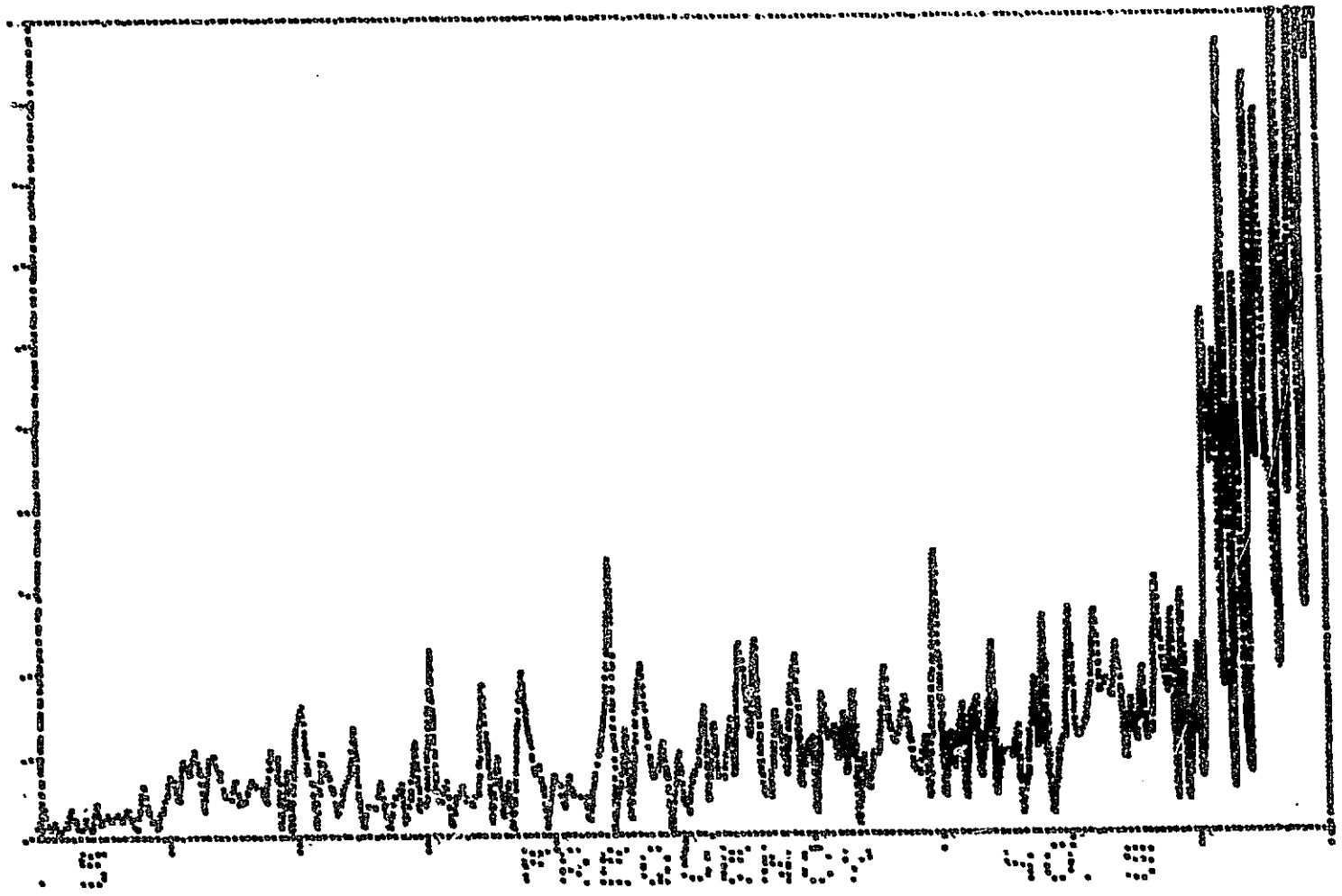


AL10/FL3

30.

11953

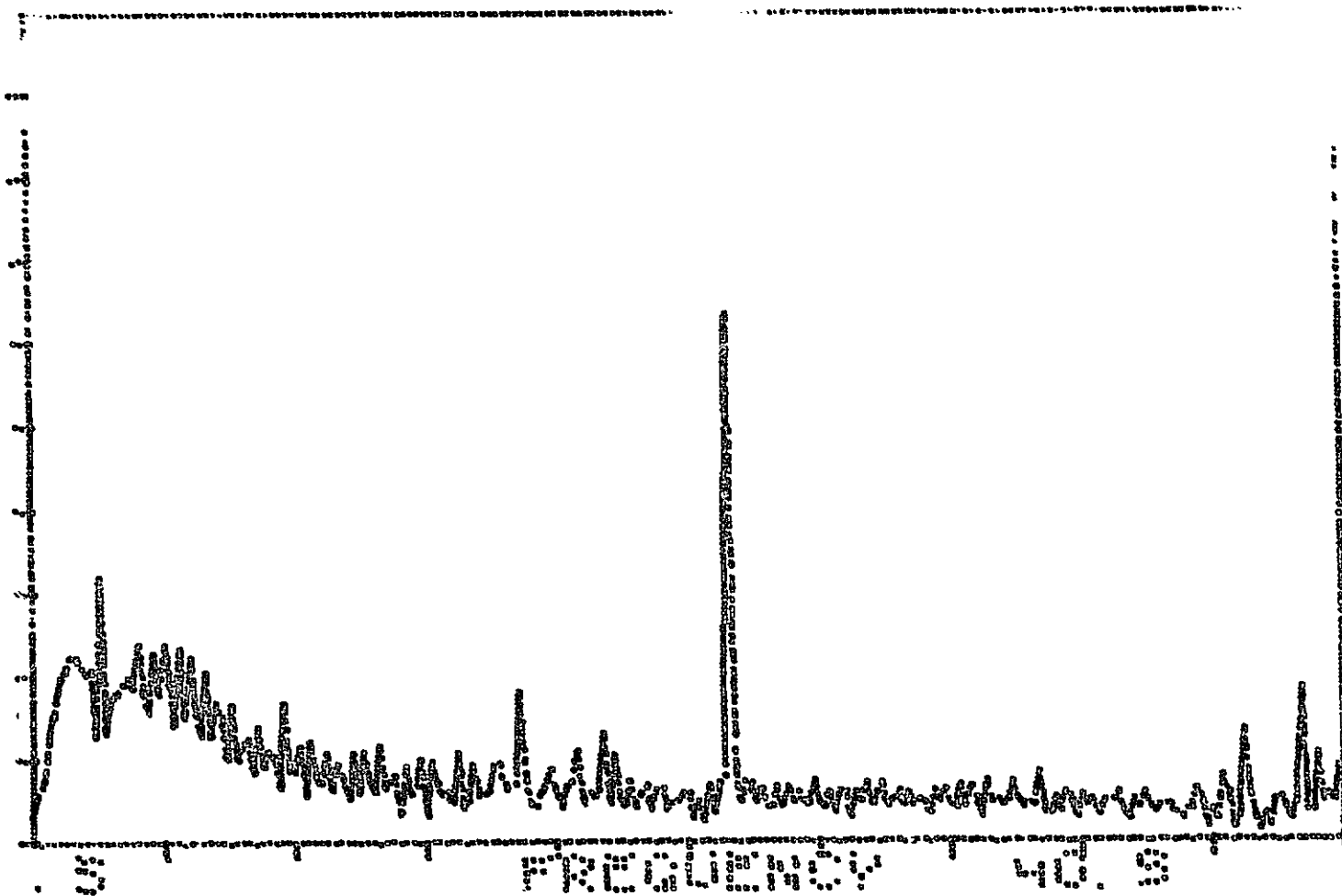
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COMPLEX

0.25 250

AL12/FL3



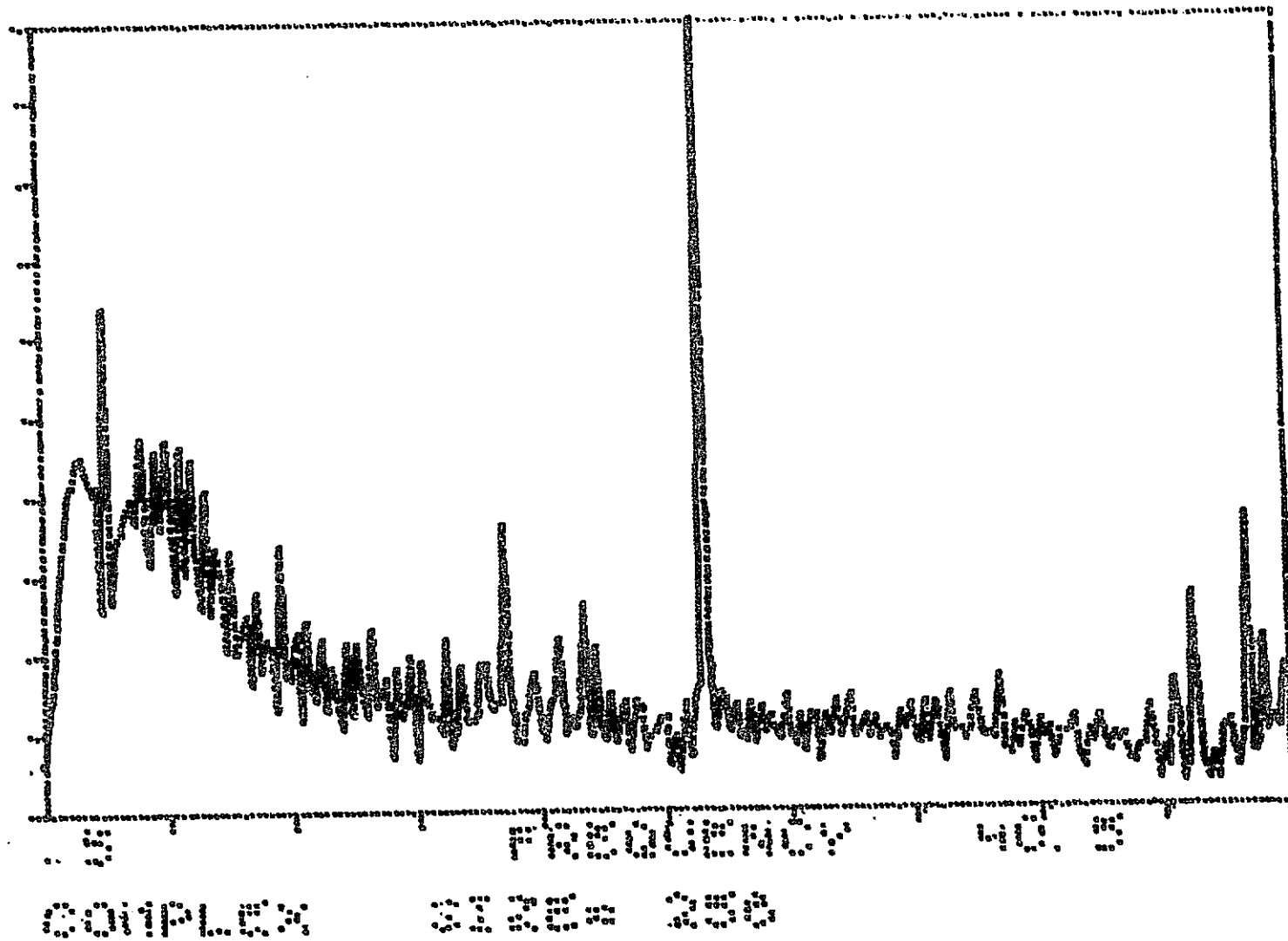
COMPLEX

01250 250

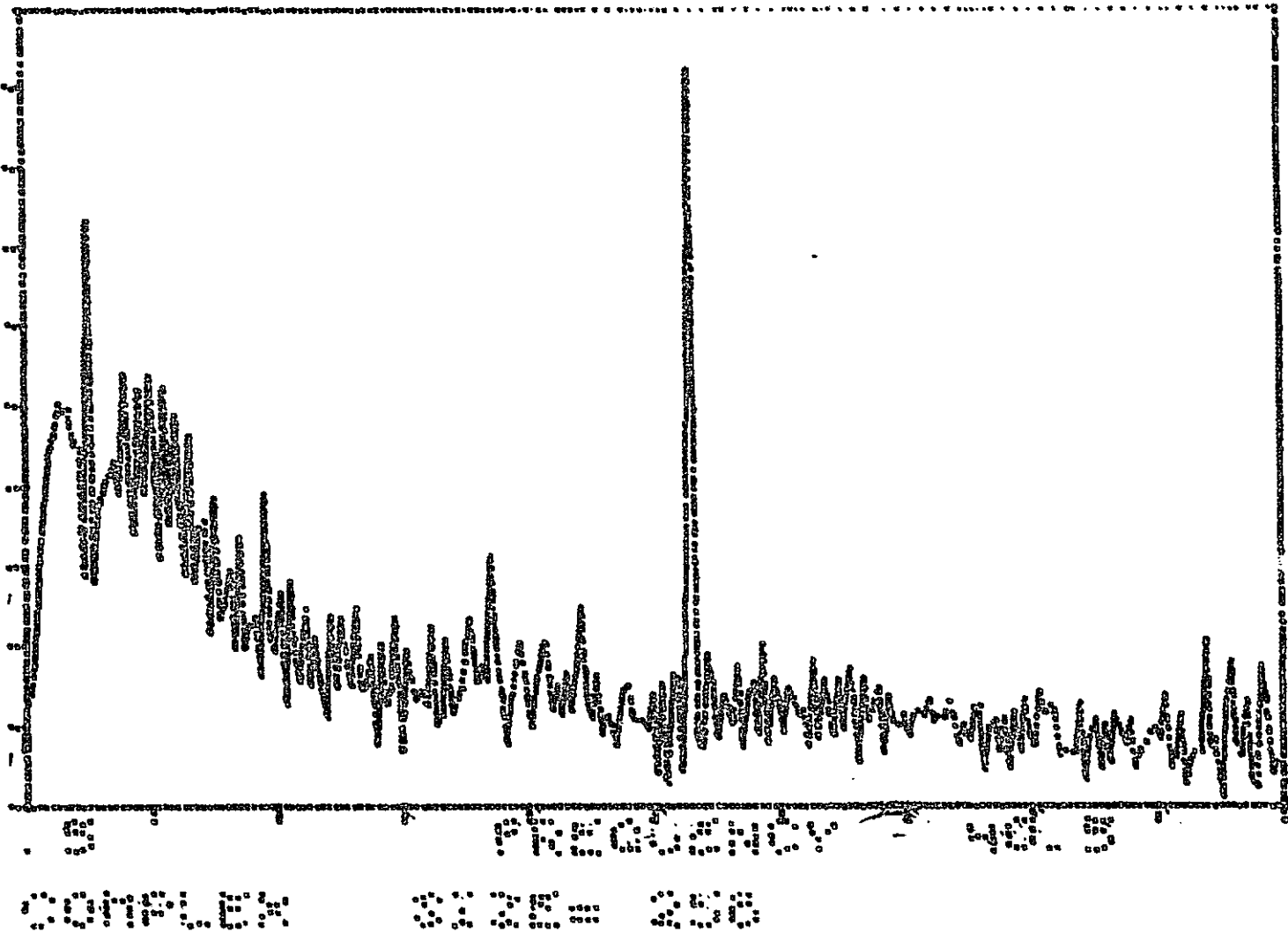
DL1/FL3

4.
HPOX

0.



DL1/FL3

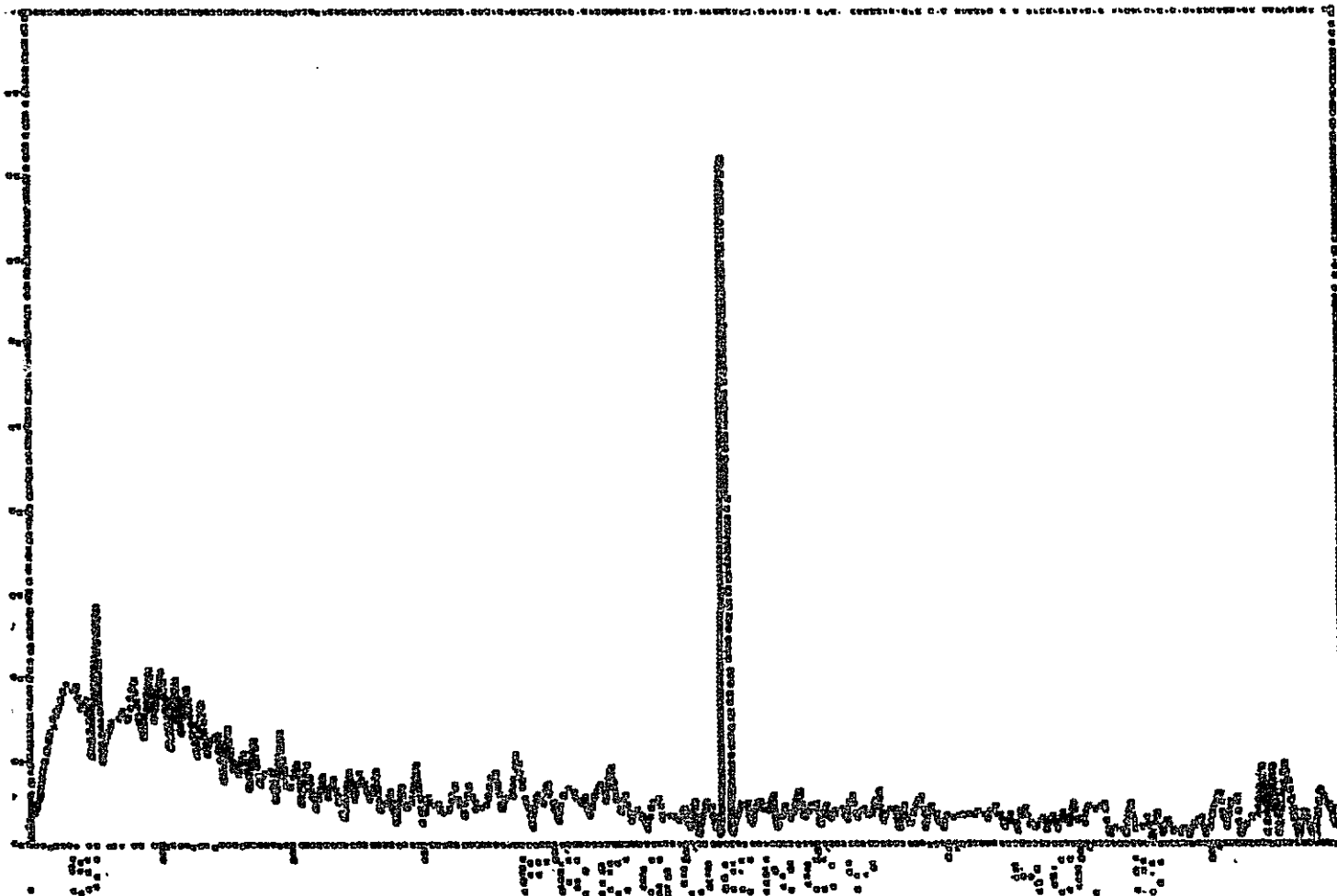


DL2/FL3

4.

1900

0.



Complex

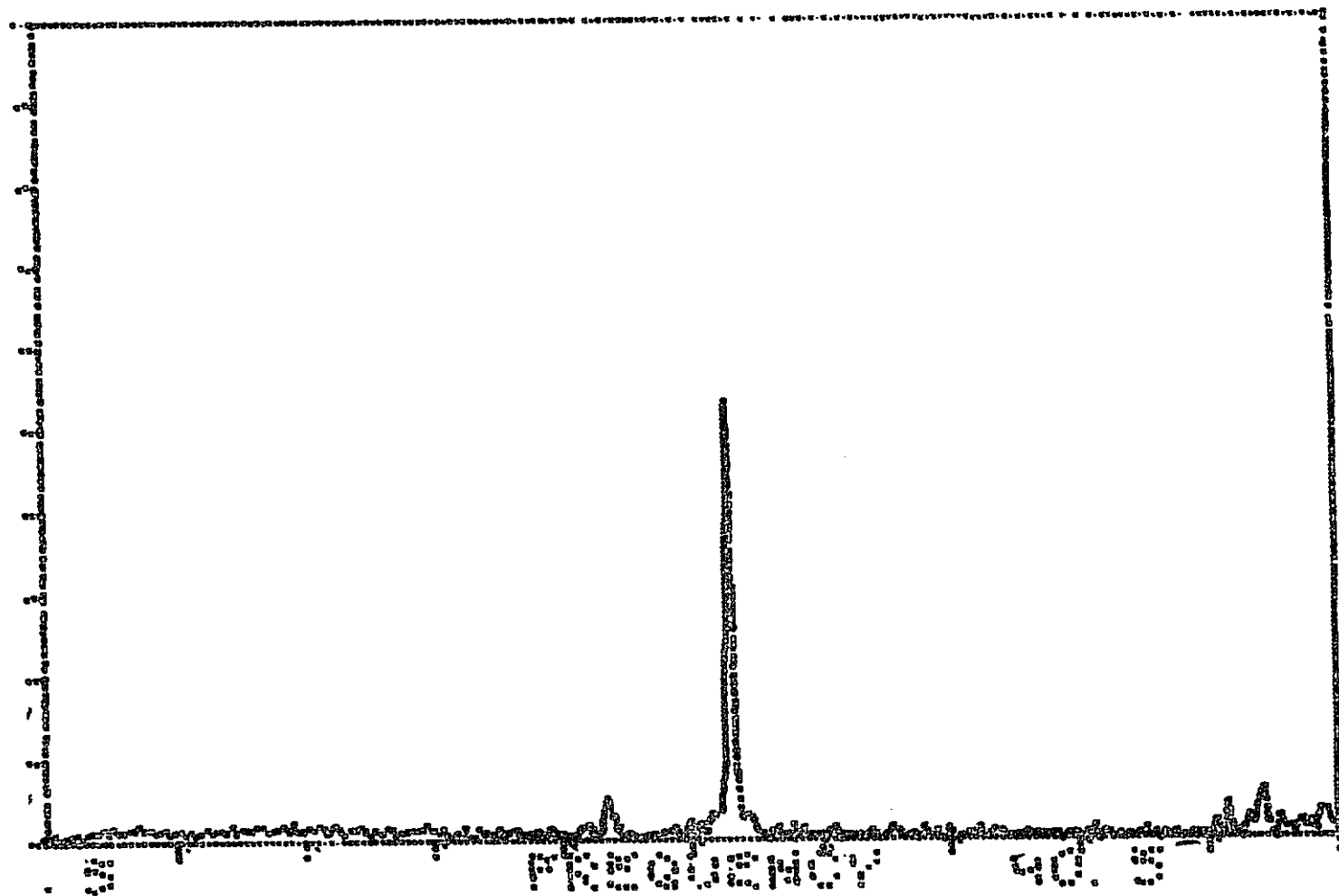
size 250

DL3/FL3

2

1988

1



CONFLA

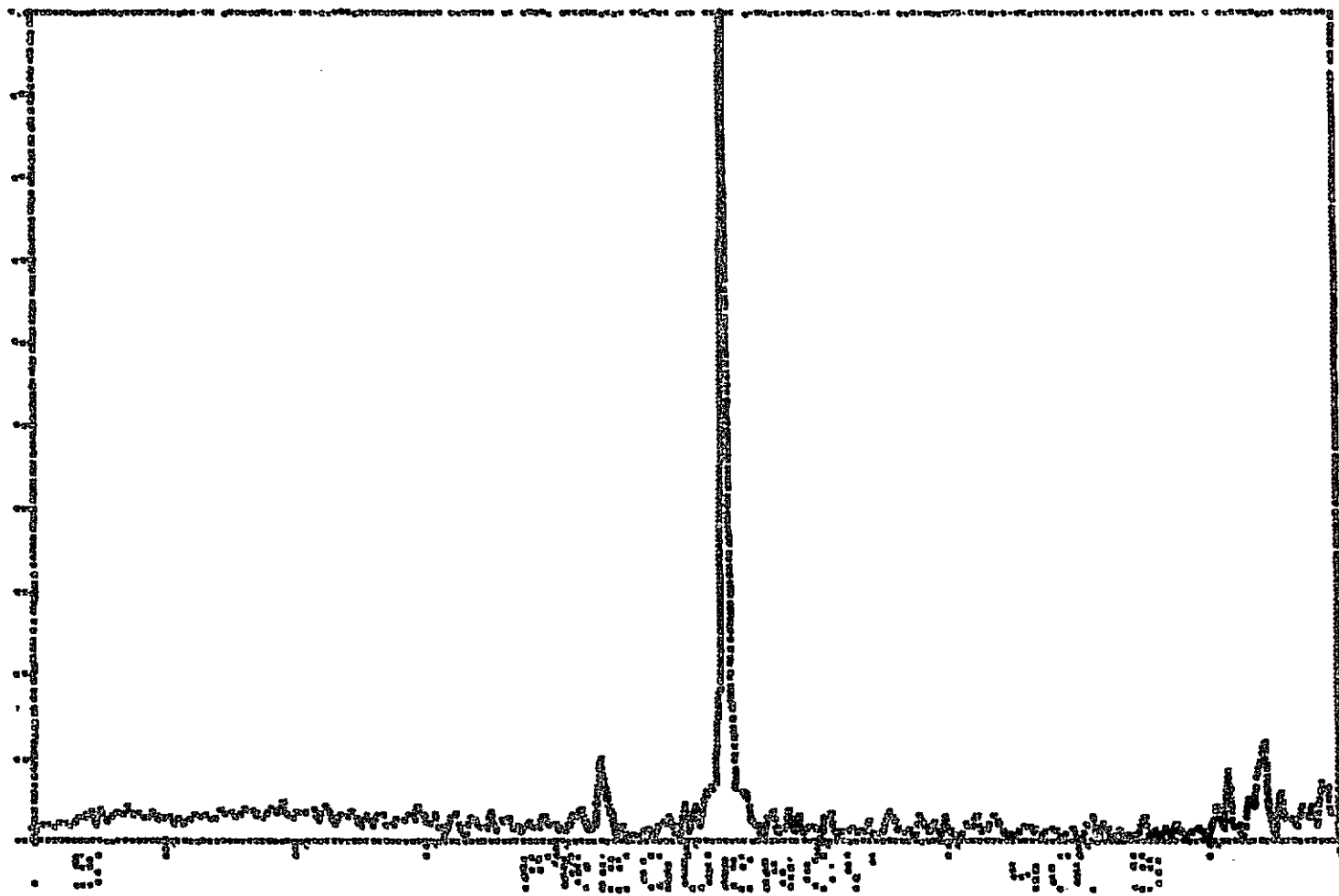
0125 250

DL4/FL3

4

1000

0



AMPLITUDE

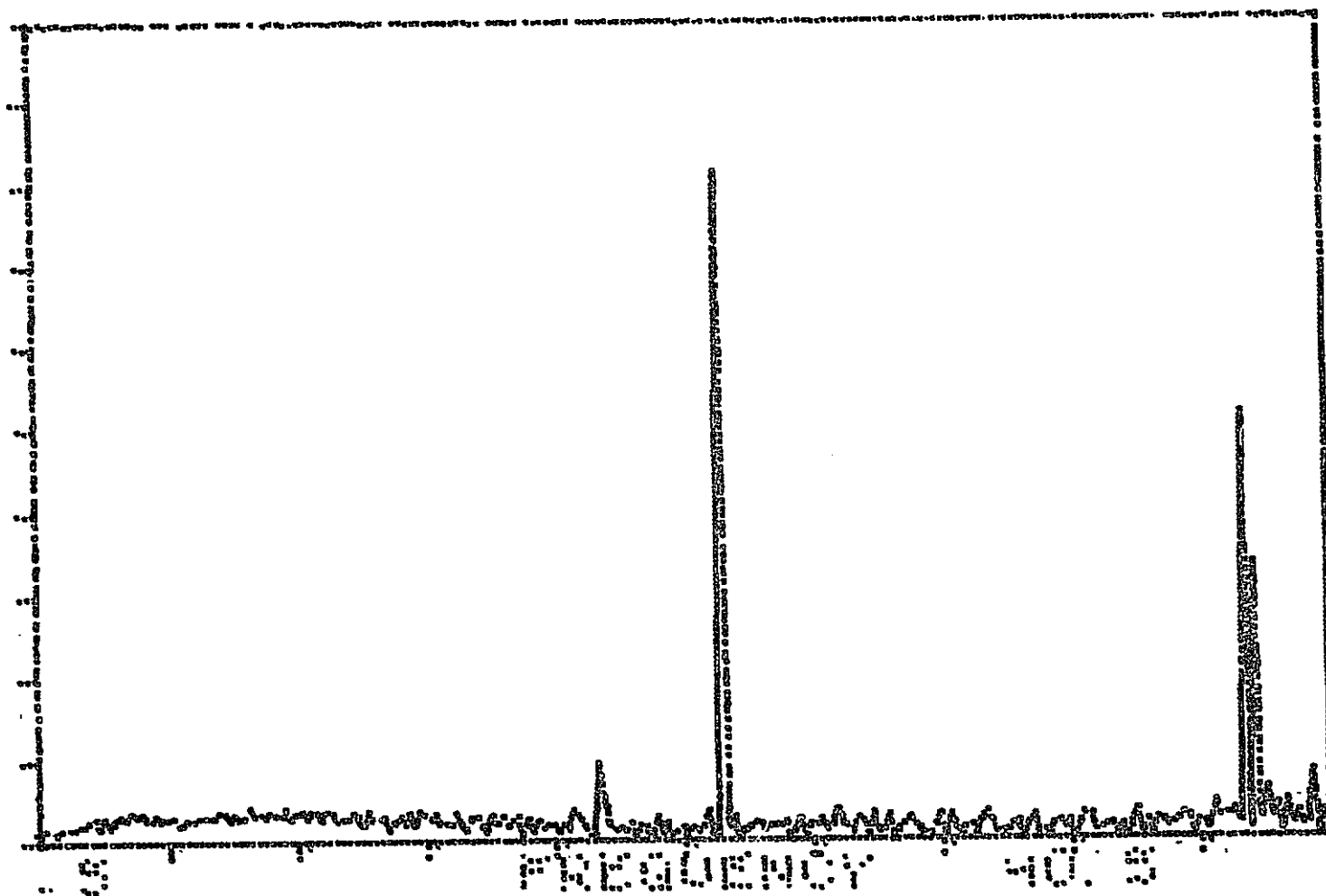
SIZE: 256

DL4/FL3

1

max

0



COMP. EN

SIZE= 250

DL5/FL3

○

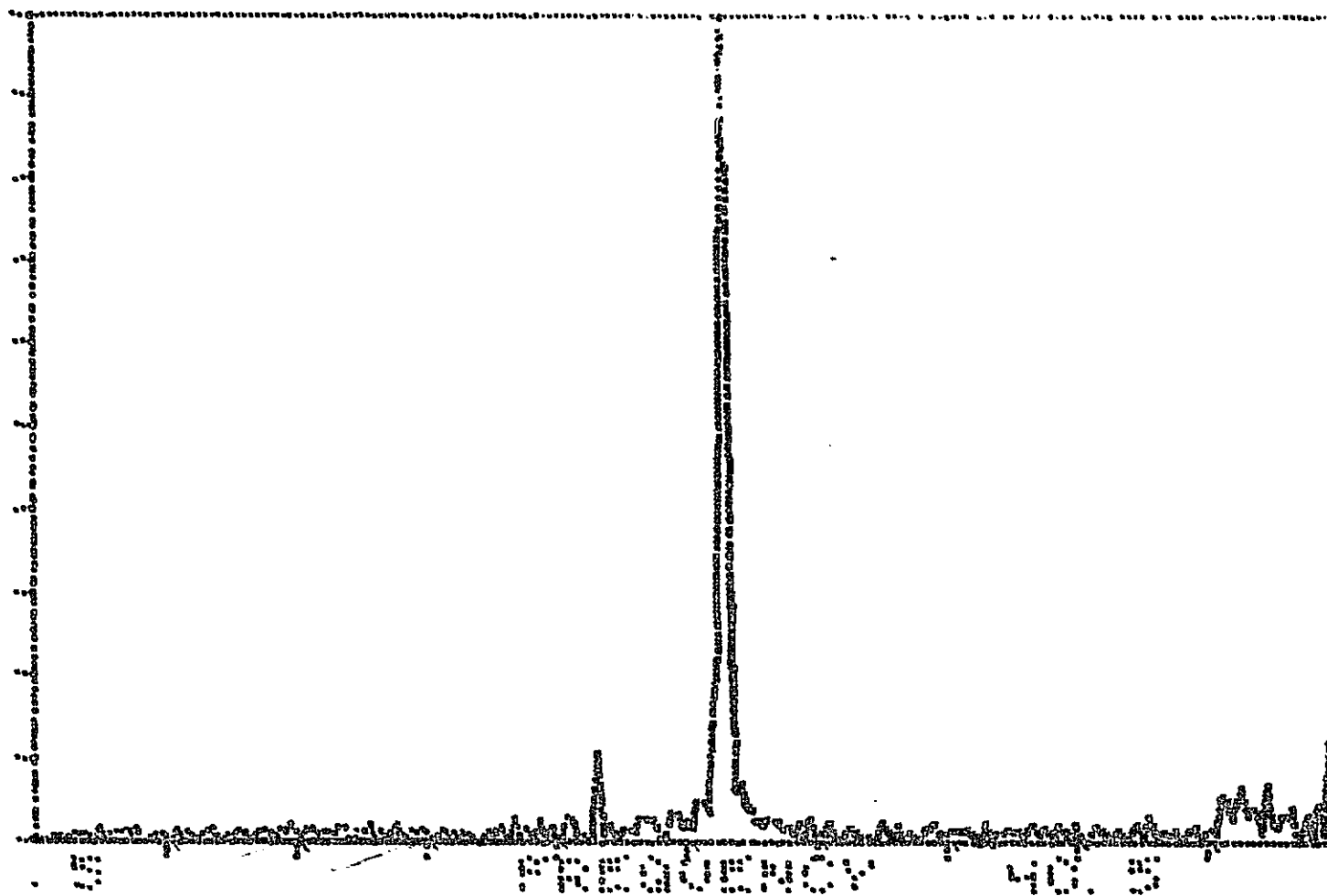
The image shows a document page that is almost entirely blank. A prominent, thick, dark vertical line runs down the right side of the page. At the bottom right corner, there are some faint, illegible markings that appear to be the numbers "495". The rest of the page is mostly white with some minor noise or artifacts.

4

4.

1160x

0.



COMPLEX

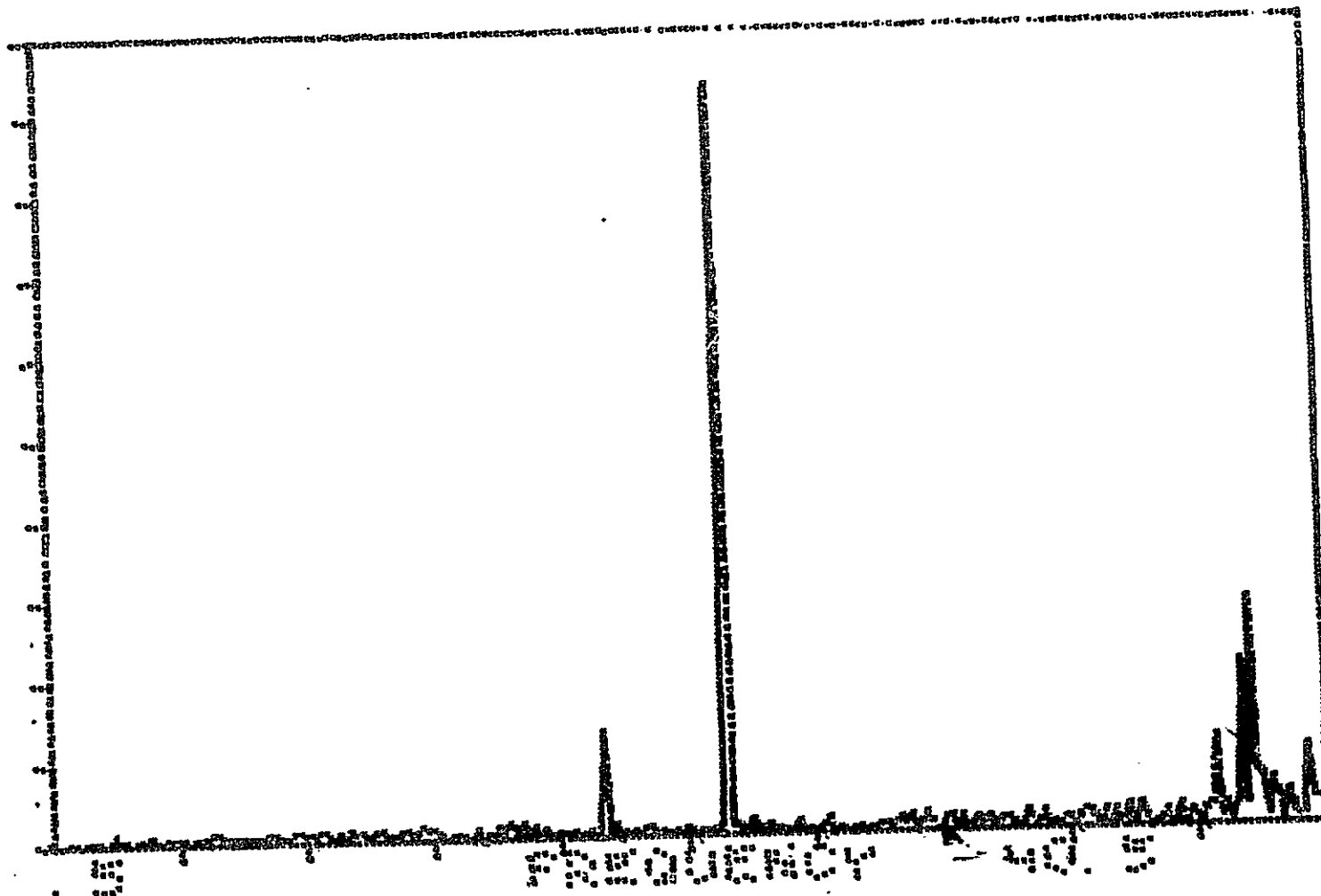
0125 250

DL6/FL3

10

1. Introduction

○



COLES

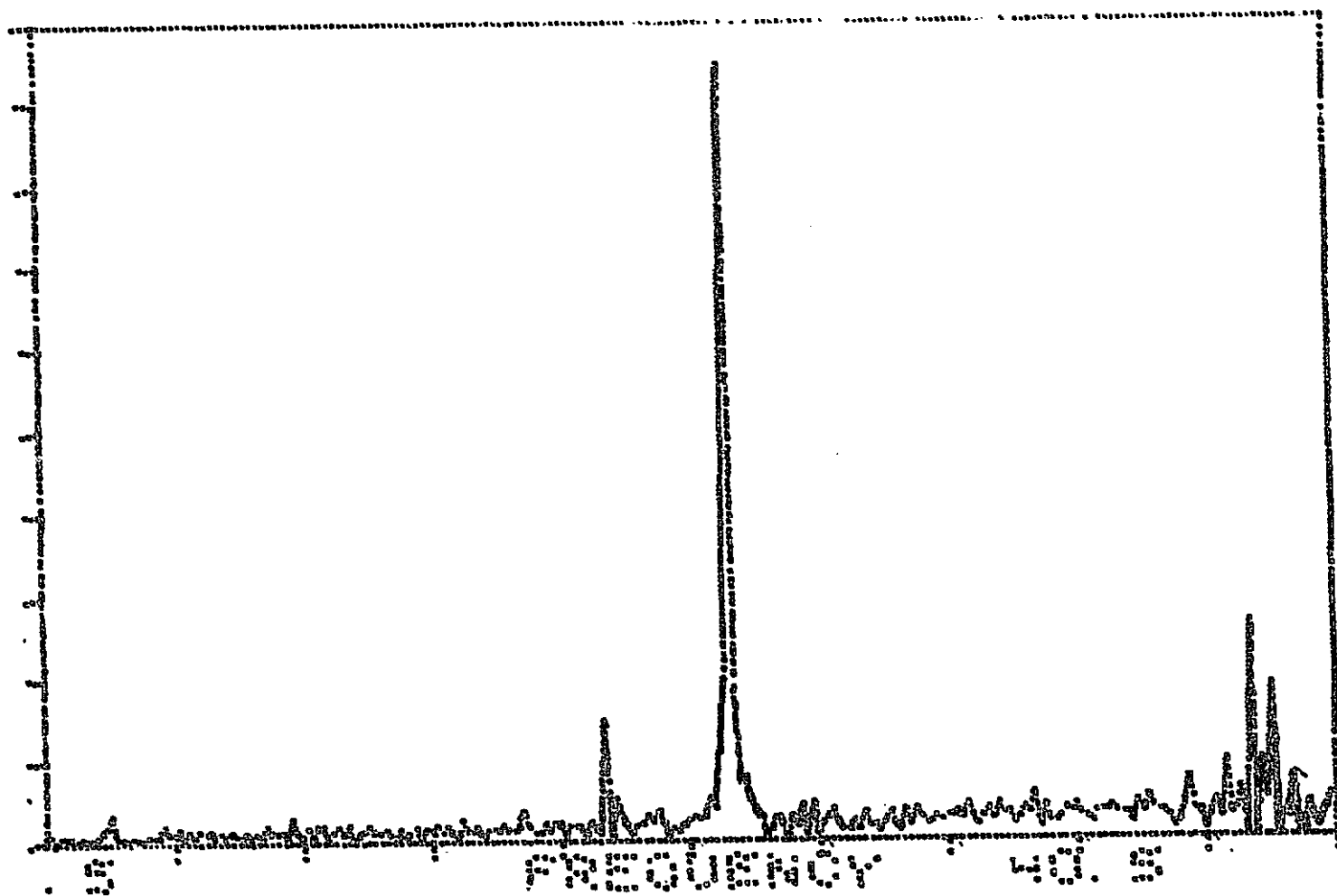
SECRET

DL7/FL3

4.

FROM

0.



COMPLEX

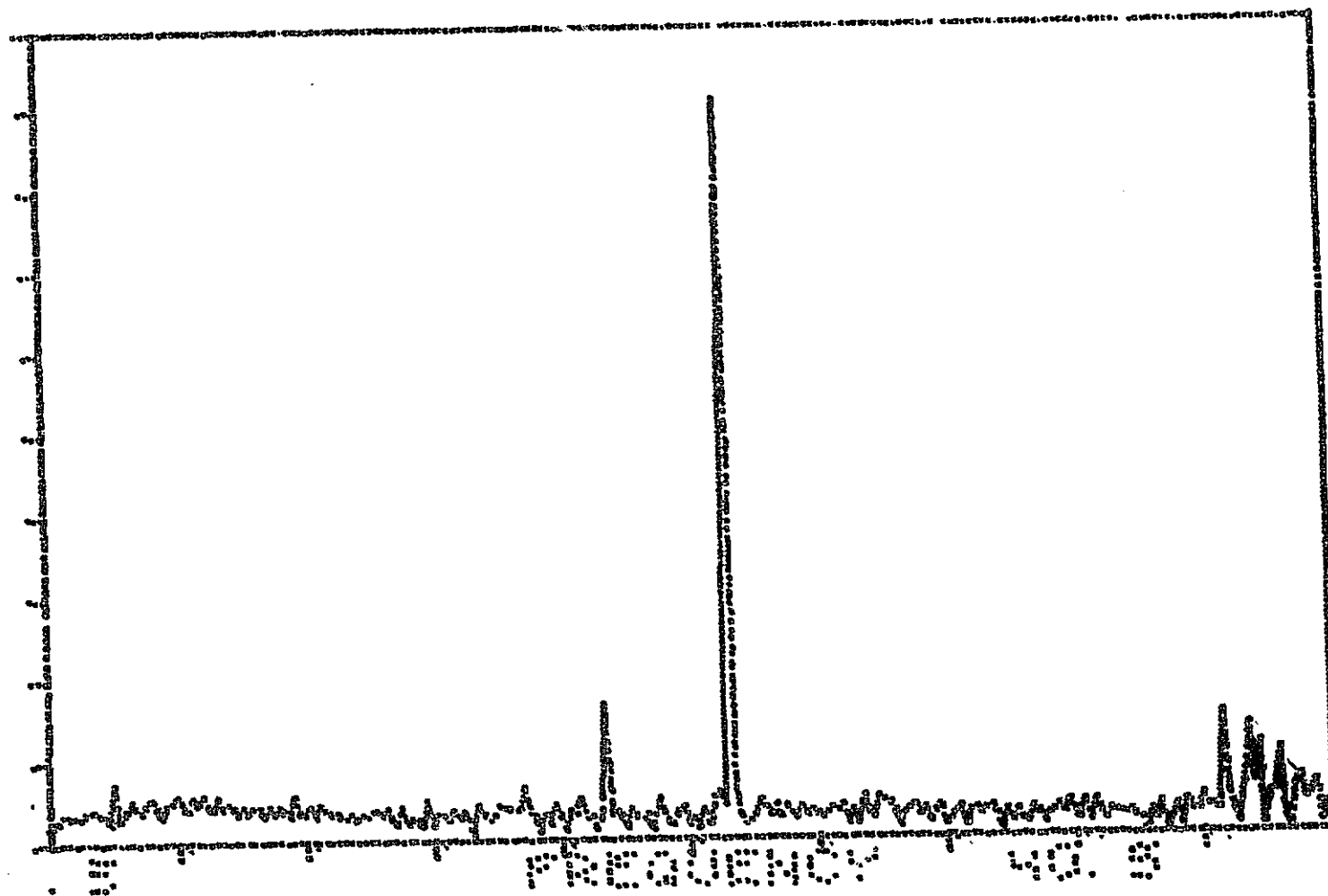
012E- 050

DL8/FL3

1.

1984

0.



COMPLEX

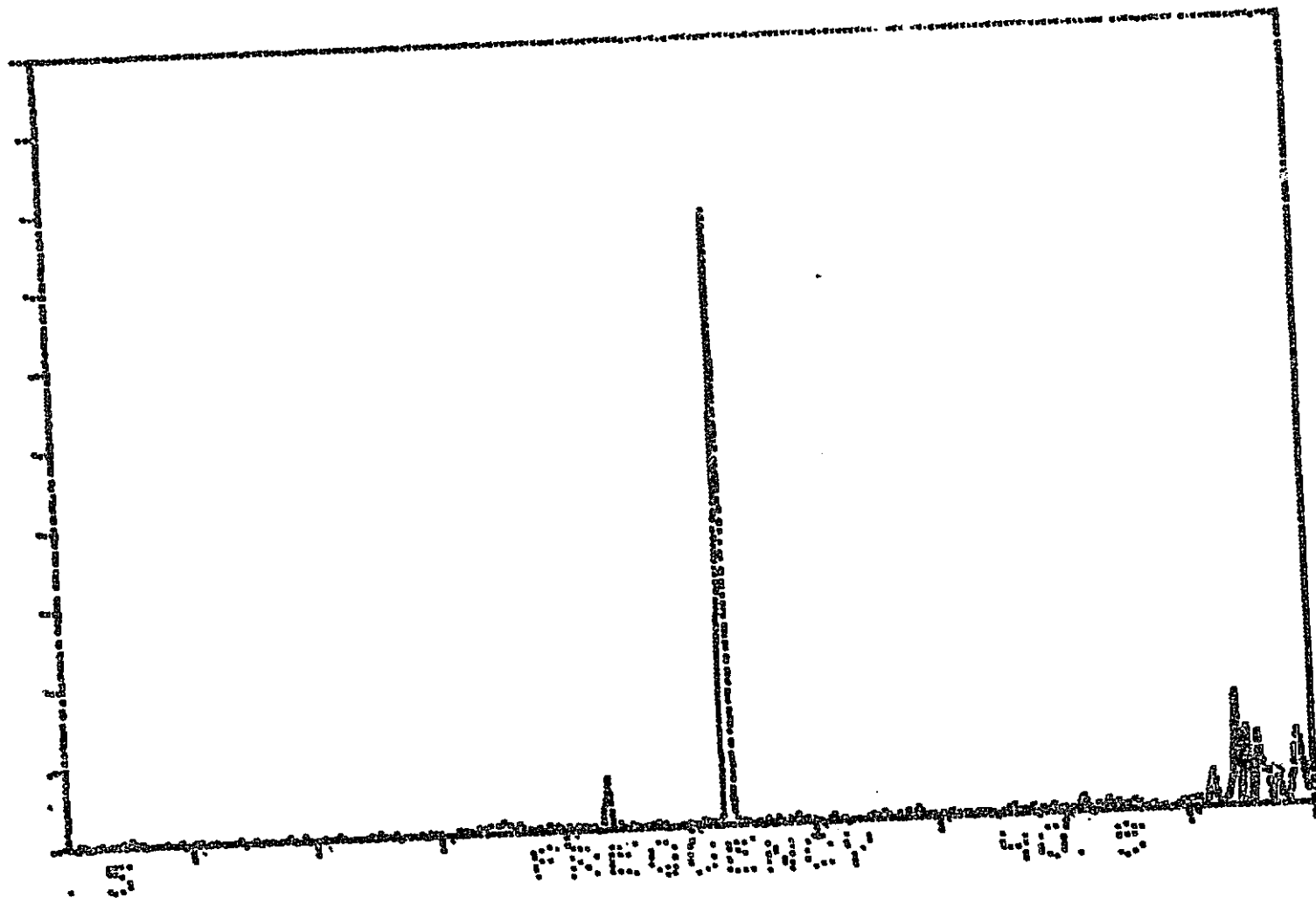
SIZE = 256

DL9/FL3

4.

1964

0.

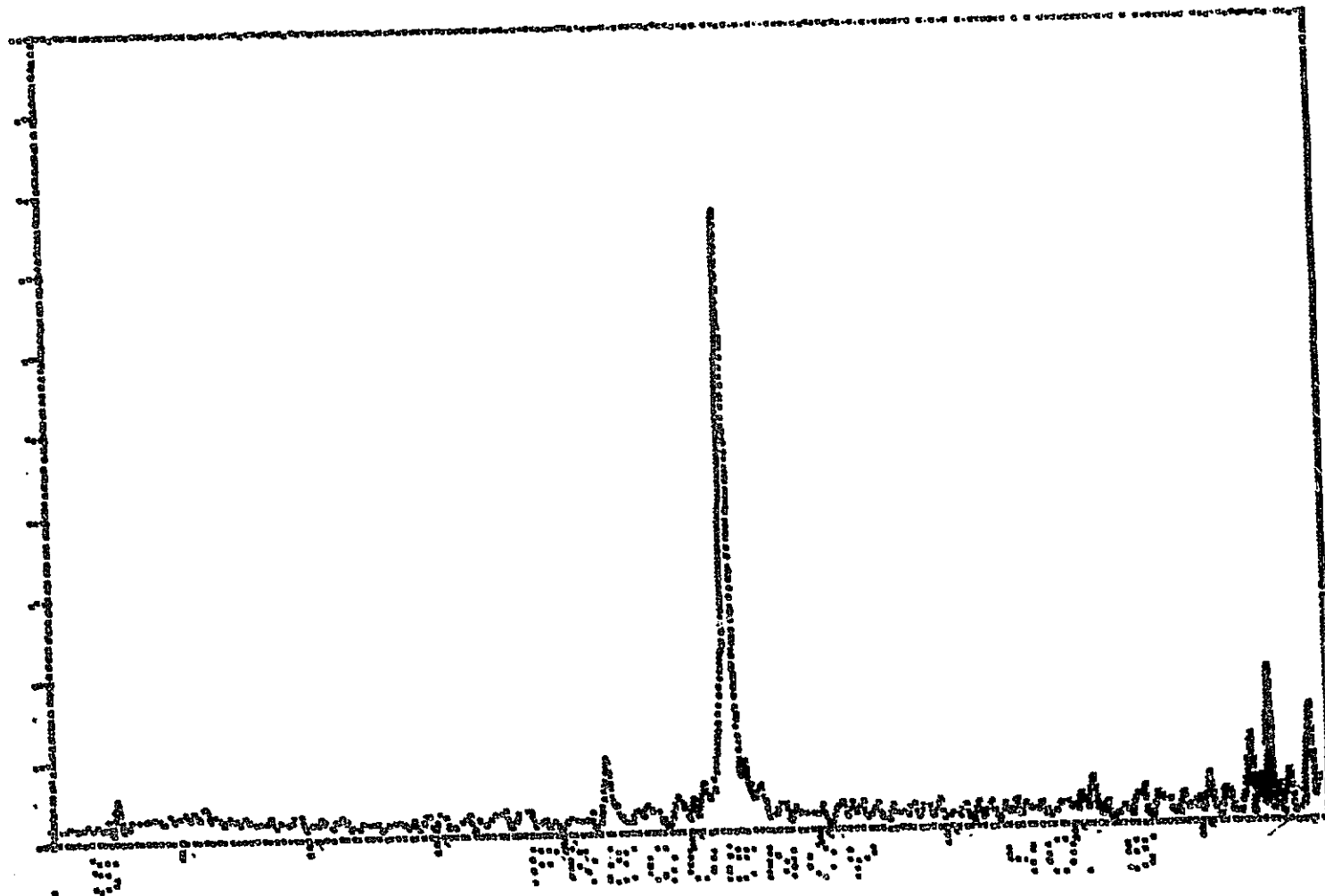


COMPLEX

SIZE= 256

DL10/FL3

1964



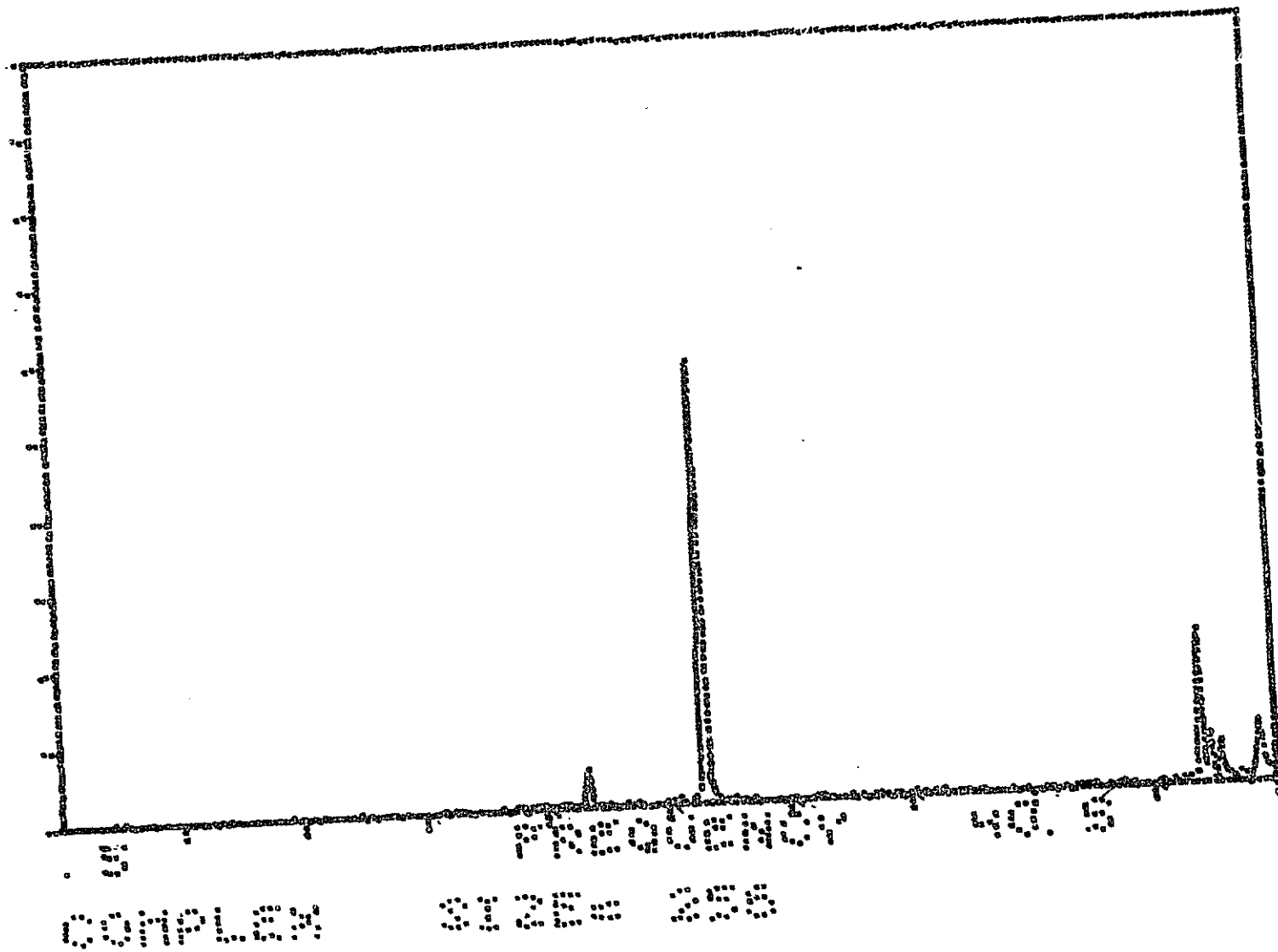
COMPLEX

31.25 358

DL11/FL3

FROM

TO

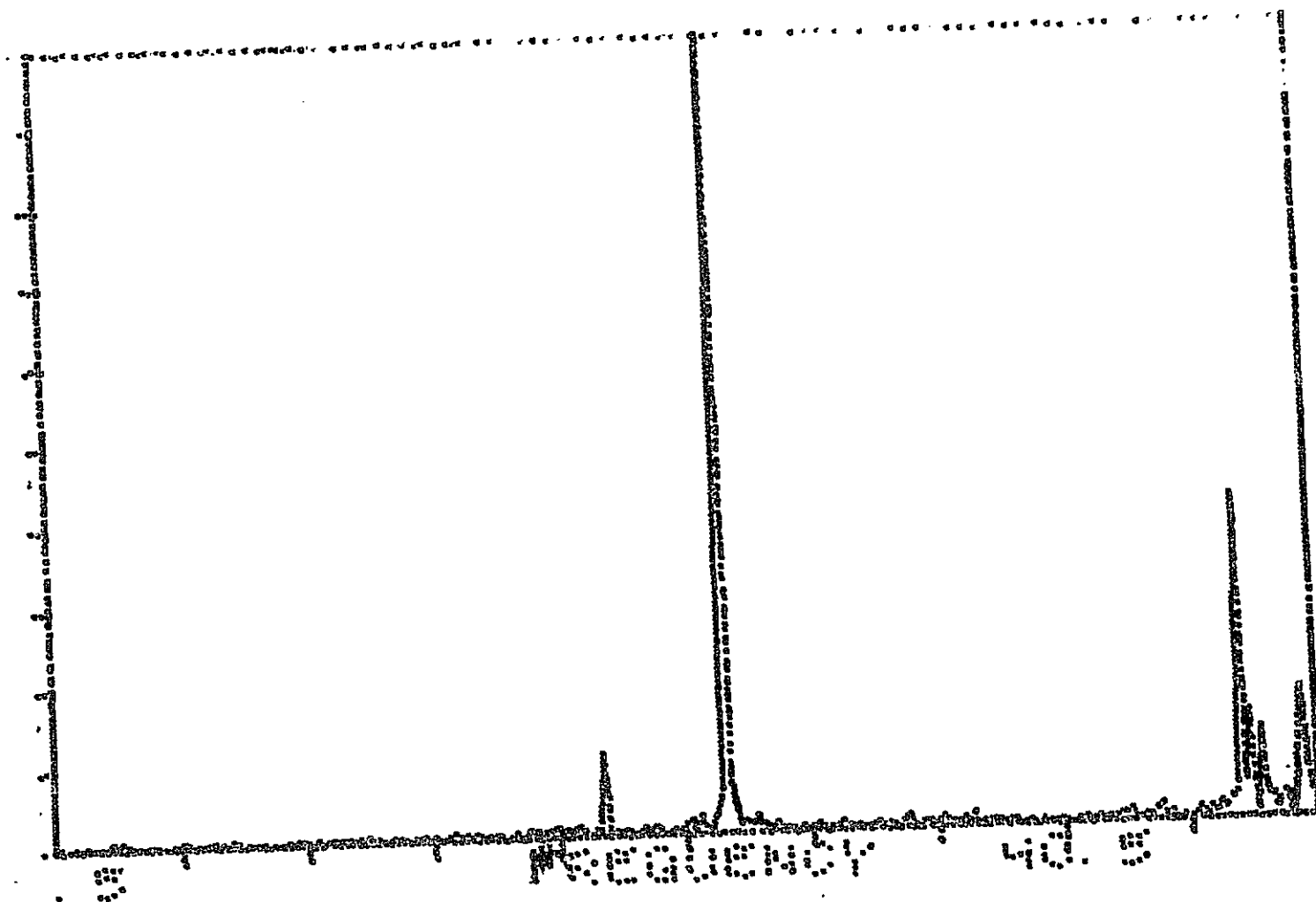


DL12/FL3

4.

7:30

9.

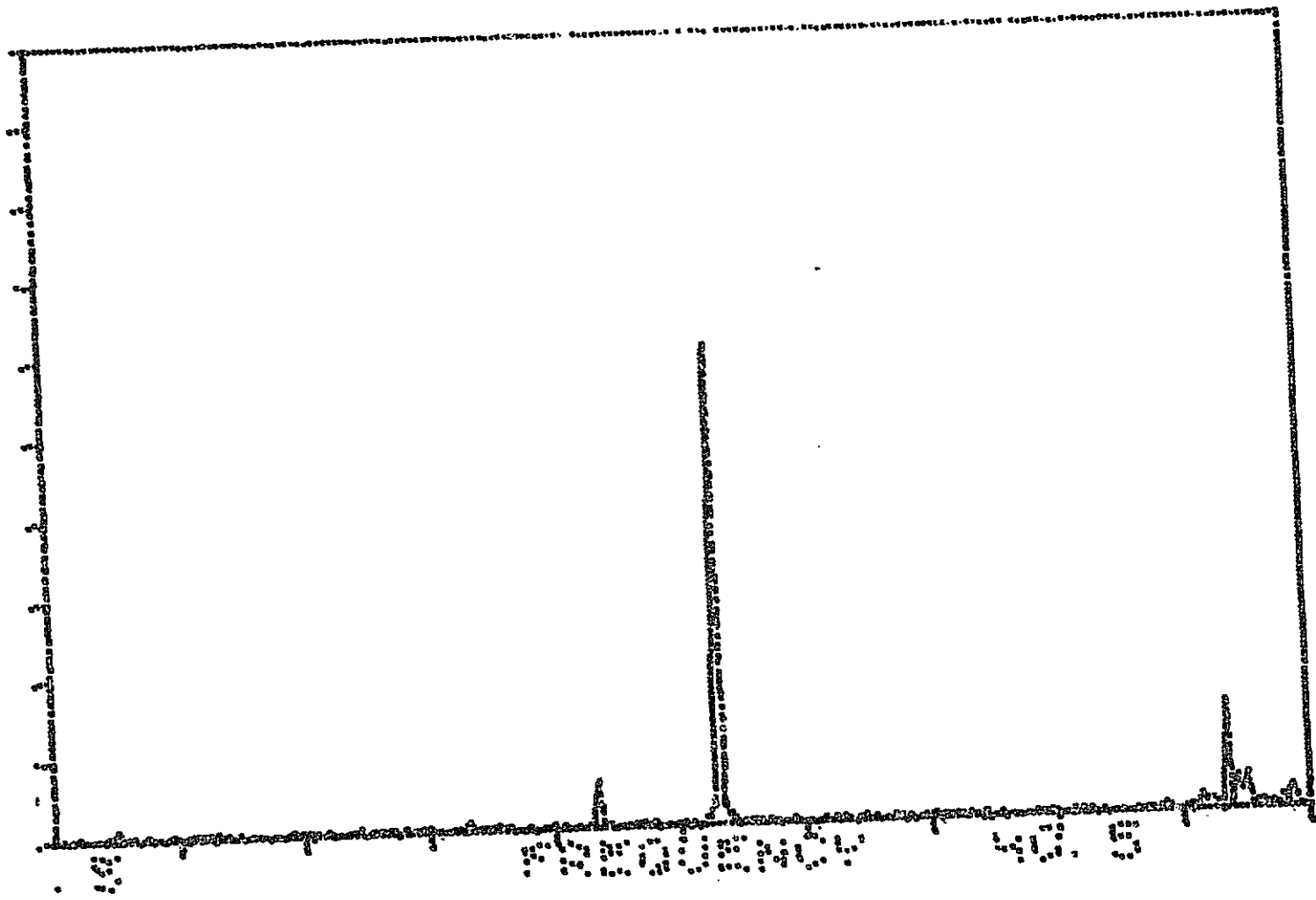


DL12/FL3

2.

0000

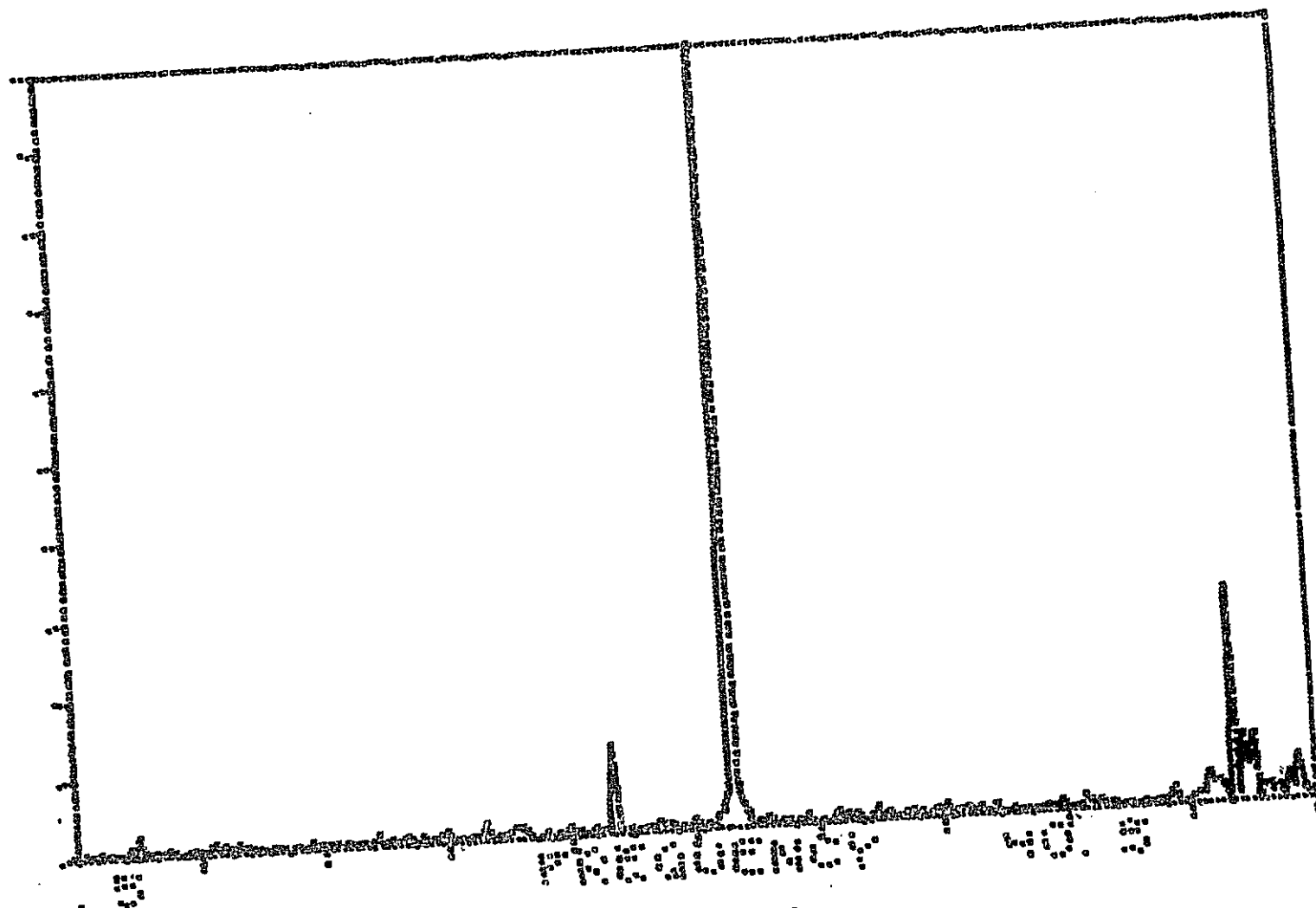
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COMPLEX

8128 258

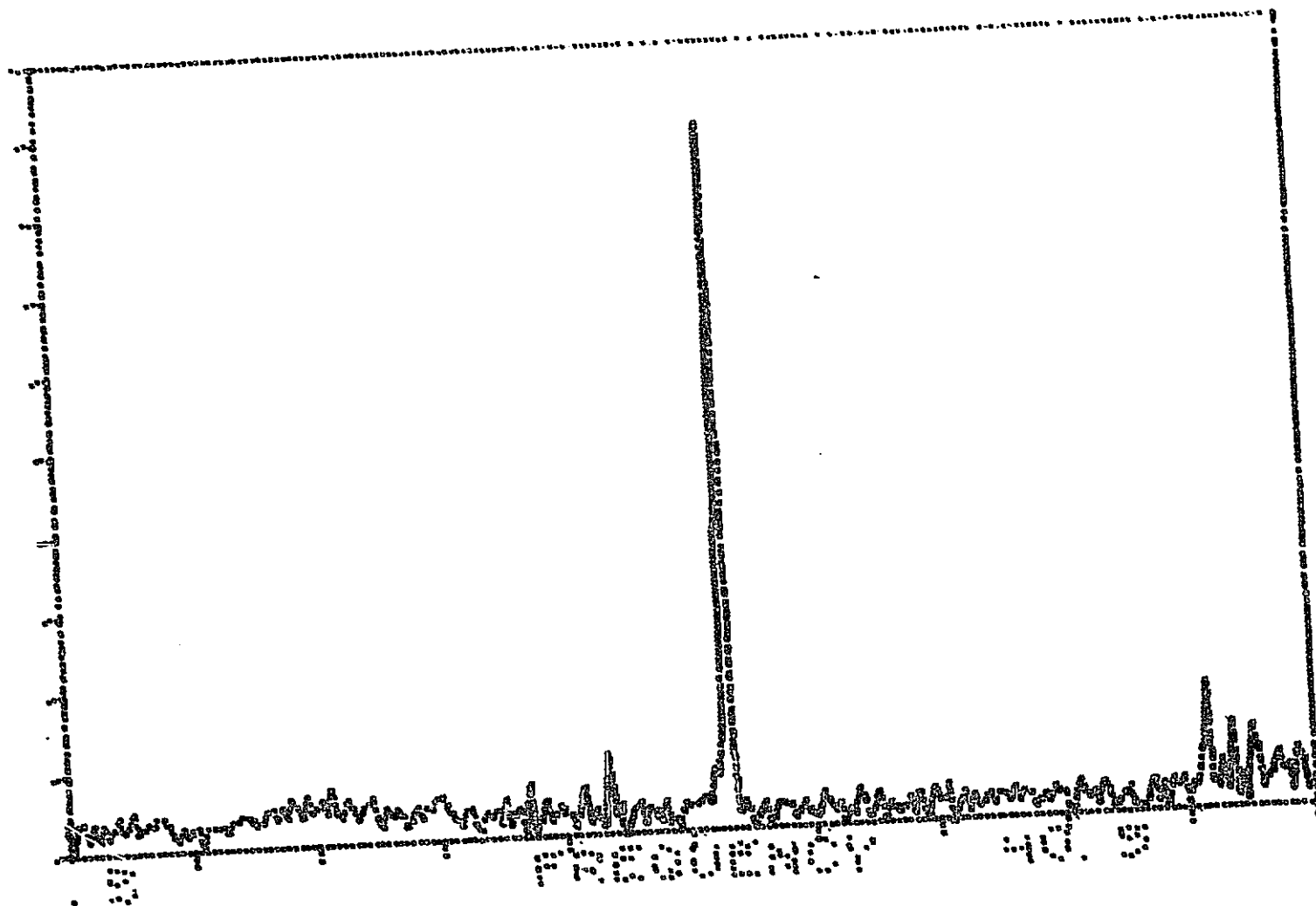
DL13/FL3



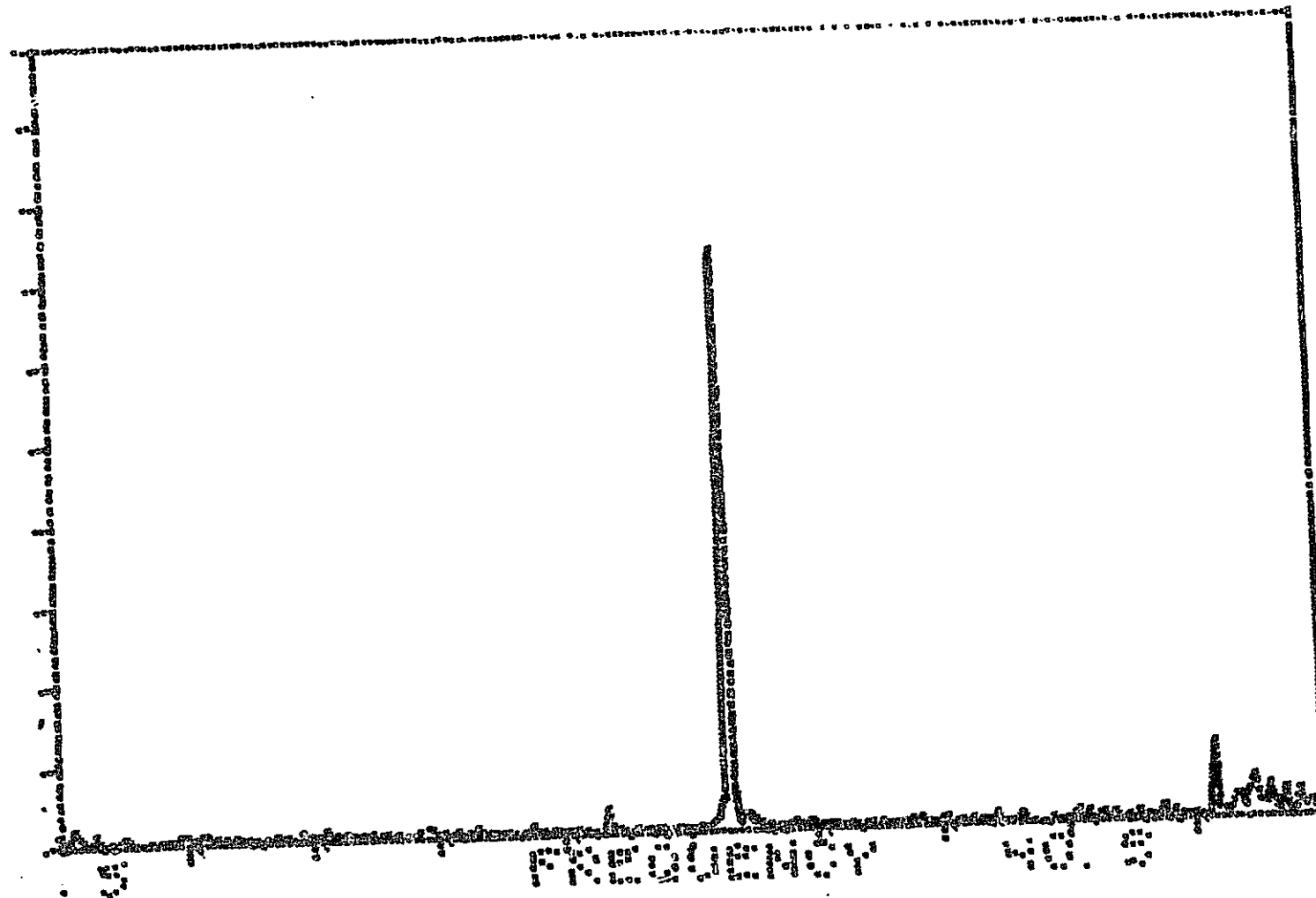
COMPLEX

250 250

DL13/FL3



COMPLEX SIZE: 355
DL14/FL3

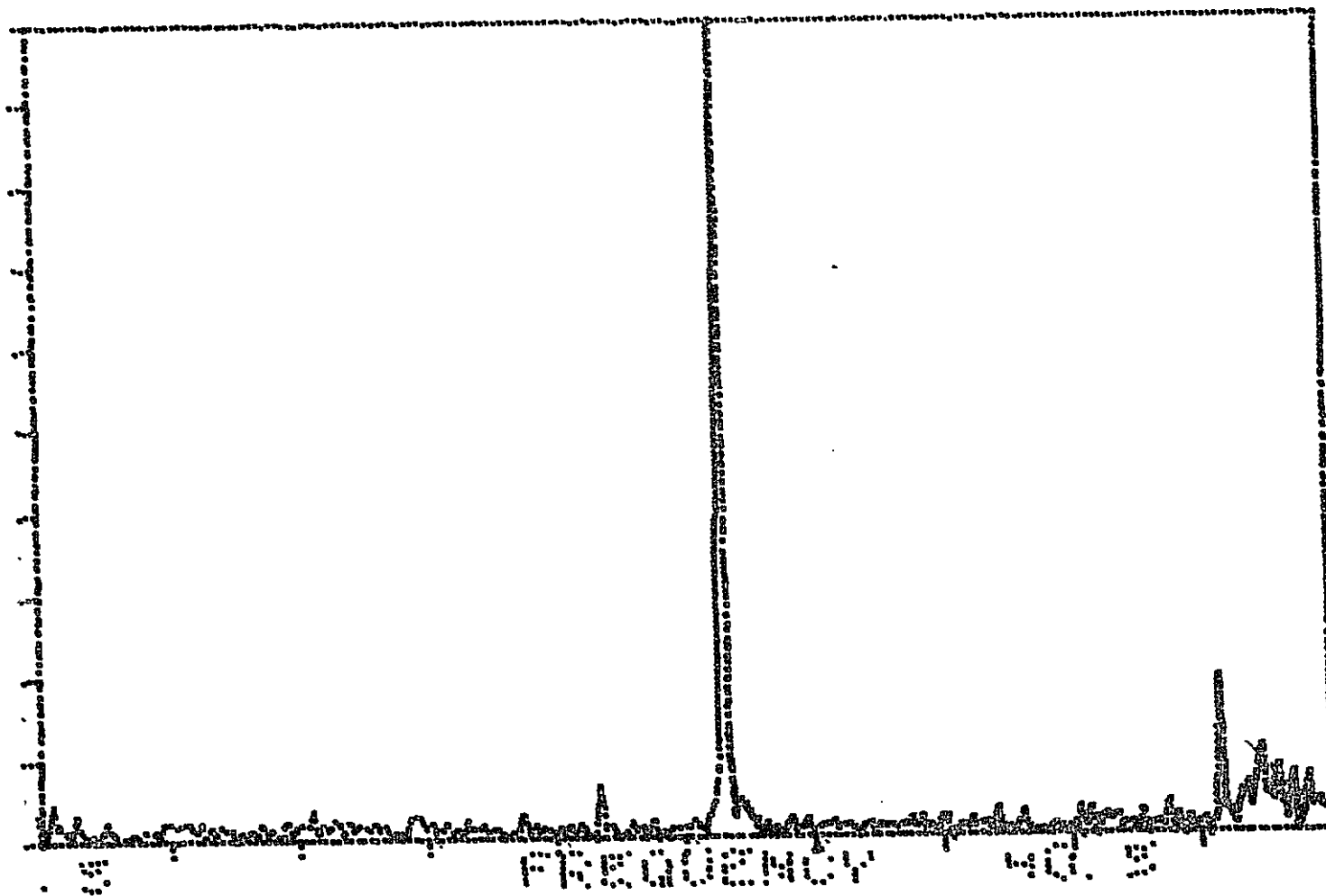


amplitude

complex

size 256

DL15/FL3



COMPLEX

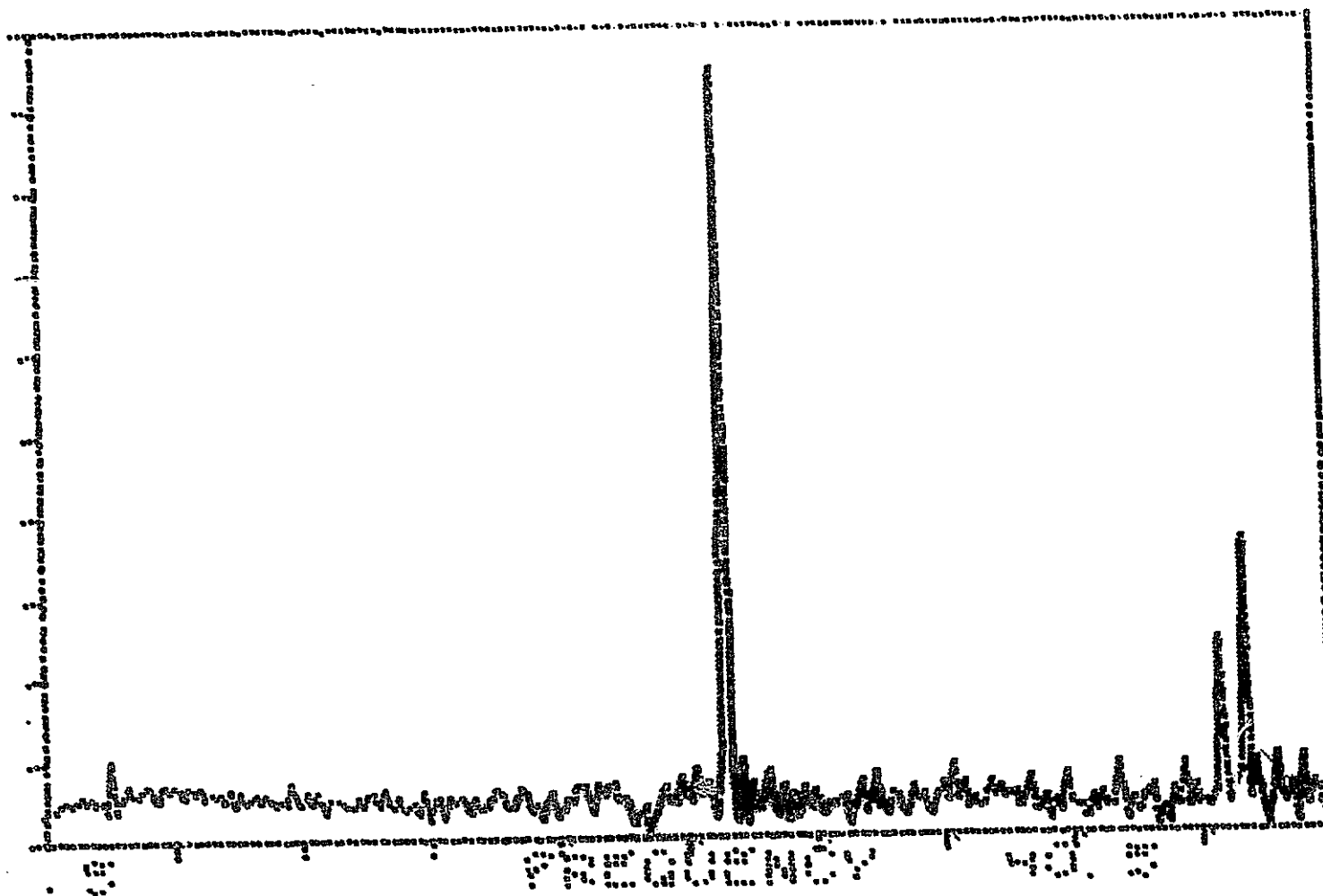
SIZE = 350

DL15/FL3

3.

nan

0.



COMPLEX

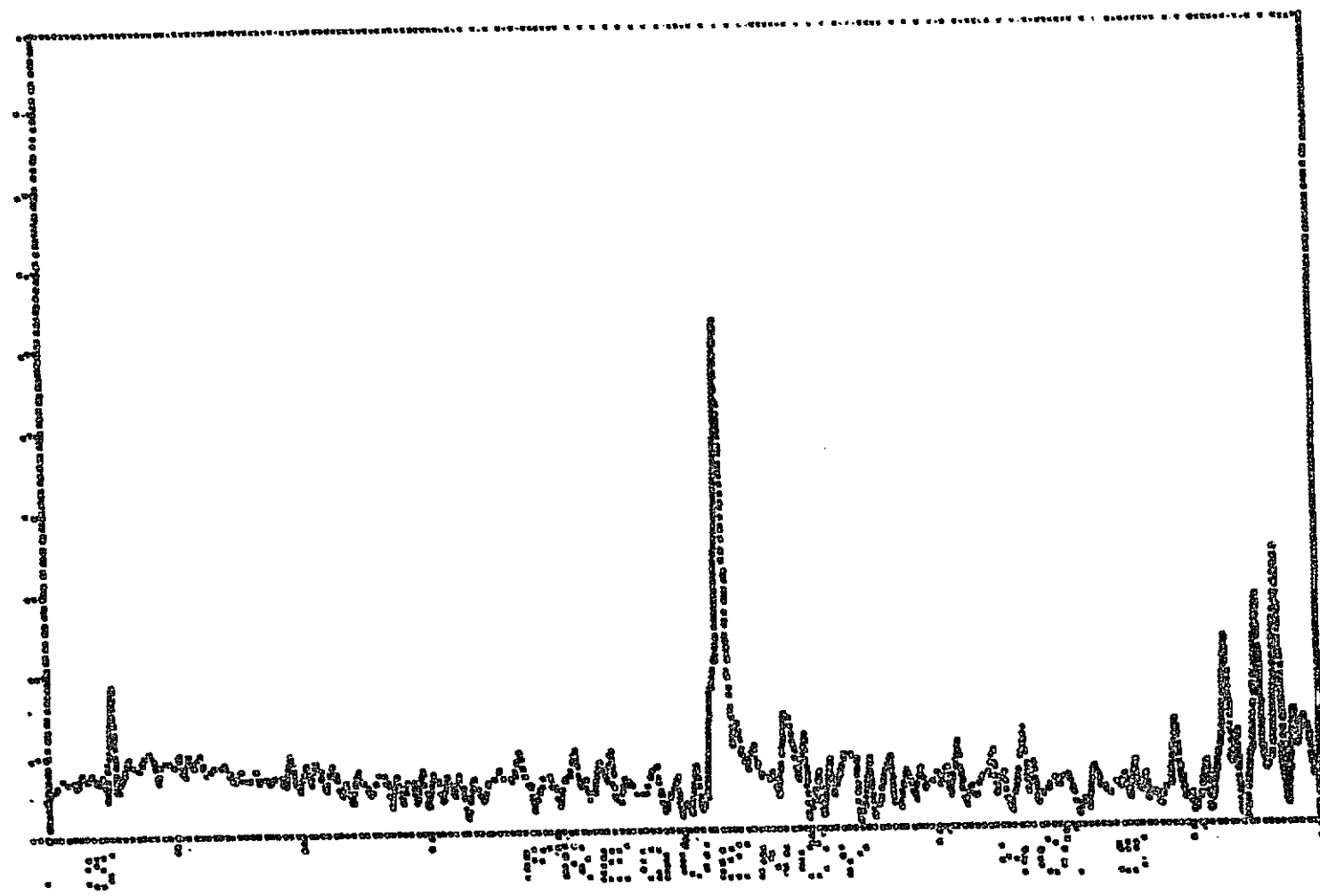
812E- 250

DL16/FL3

1.

NAME

0.



COMPLET

SIZE = 255

DL17/FL3



VOLUME IV

RUN 46 TEST DATA

X-AXIS, 5010 POUND/ACTUATOR TEST LEVEL,
SINGLE ACTUATOR



1 HEADING: TRK TRN TRANS FUNCT Z=AXIS 5010 LB R#46 3/31/75

SWEEP PARAMETERS:

2 MODE 1=LOG, 0=LIN: 1
 3 TYPE 1=UNI-DIRECTIONAL, 0=BI-DIRECTIONAL: 1
 4 START, END FREQ, HZ: .5, 50
 FREQ RANGE -- OCTAVES, DECADES: 6.64 2.
 5 SPECIFICATION 1=RATE, 0=DURATION: 1
 6 UNITS 1=OCT/MIN, 0=DEC/MIN: 1
 7 RATE, OCT/MIN: 2
 SWEEP DURATION -- MIN, SEC: 3 19

TEST LENGTH:

8 SPECIFICATION 1=TIME, 0=SWEEP CYCLES: 0
 9 CYCLES: 1
 TEST TIME -- HRS, MIN, SEC: 0 3 19

START-UP AND SHUT-DOWN:

10 START-UP TIME, SEC: 120
 11 SHUT-DOWN TIME, SEC: .5

VIBRATION LIMITS (P-P):

12 DISPLACEMENT, IN: 5000
 13 VELOCITY, IN/SEC: 9999
 14 ACCELERATION, G: 450

REFERENCE CONTROL SPECTRUM:

15 TYPE, VALUE, FREQ, ABORT LIMIT: 2, 60, .5, 8
 16 TYPE, VALUE, FREQ, ABORT LIMIT: 2, 60, 5, 8
 17 TYPE, VALUE, FREQ, ABORT LIMIT: 2, 60, 50, 4
 18 TEST LEVEL (DB BELOW REF): 6

ACCELERATION SIGNALS:

19 NR OF SIGNALS: 1
 CHANNEL NRS: 1
 20 1=PEAK, 0=RMS: 0
 21 SENSITIVITY, MV/G: 22.22
 22 STRATEGY 1=MAX, 0=AVG: 1

LIMIT SIGNALS:

23 NR OF SIGNALS: 0

ABORT LINES:

24 NR OF LINES: 0

ALARM LINES:

25 NR OF LINES: 0
 26 1=DUAL-CHANNEL A/D, 0=ACE: 1
 27 COMPRESSION SPEED 2=HIGH, 1=NORMAL, 0=LOW: 1

POST-TEST DOCUMENTATION

TRK TRN TRANS FUNCT Z-AXIS R# 46 4010LB 3/31/75

COMPLETION STATUS: ABORTED DURING SWEEP 1 AT 27.58 HZ.
CONTROL LIMITS EXCEEDED.

TEST DURATION -- HRS, MIN, SEC: 0 2 53

MAX ABS CONTROL ERROR: 6.32 DB AT 1.208 HZ.
AVG ABS CONTROL ERROR: .2454 DB.CONTROL
CHANNEL FREQ RANGE (HZ)

SWEEP 1

1 .5-- 27.58

Q.

RAM

Q.

Q.

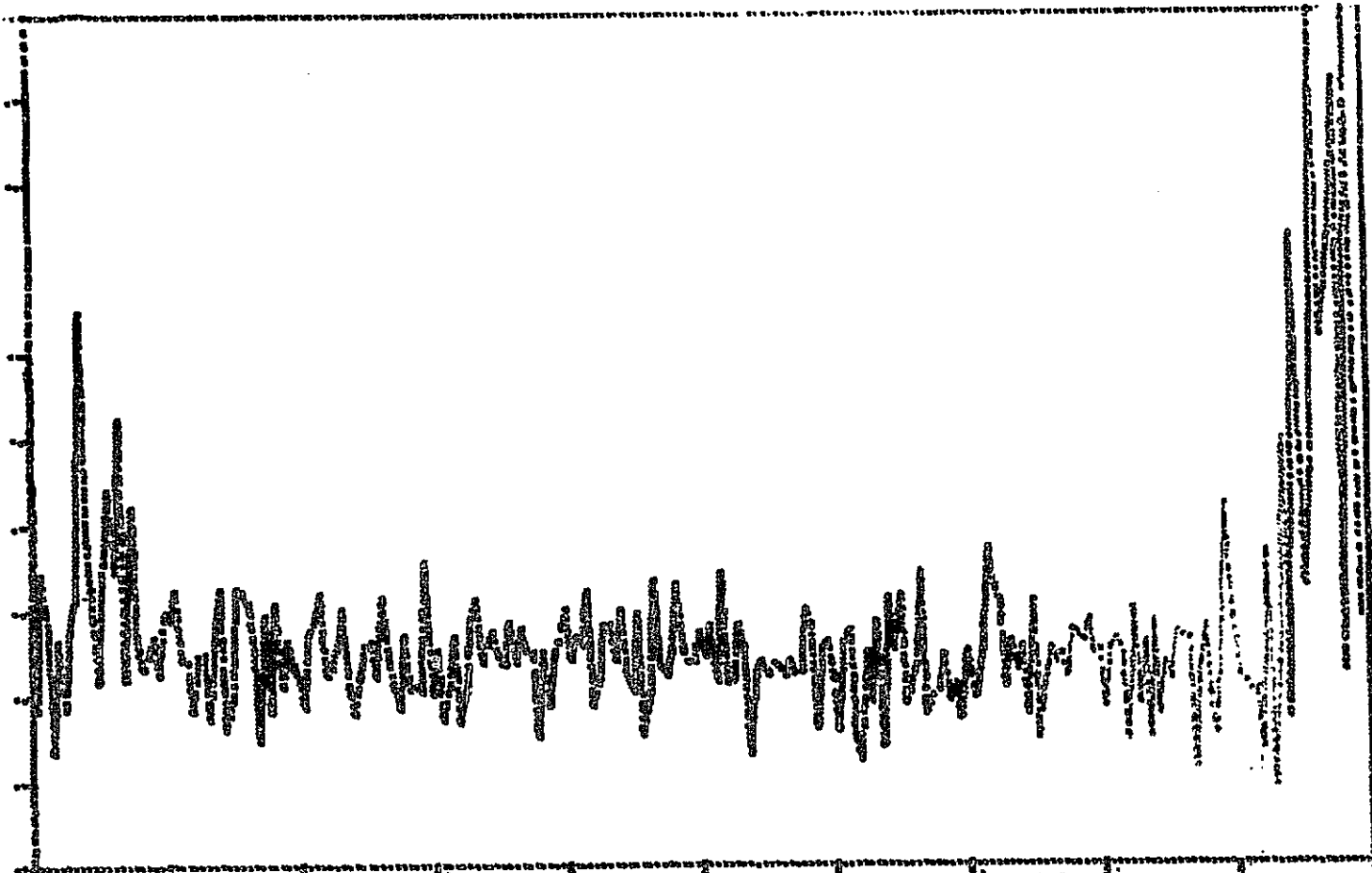
COMPLEX

PROBABLY

Q.

SIZE 255

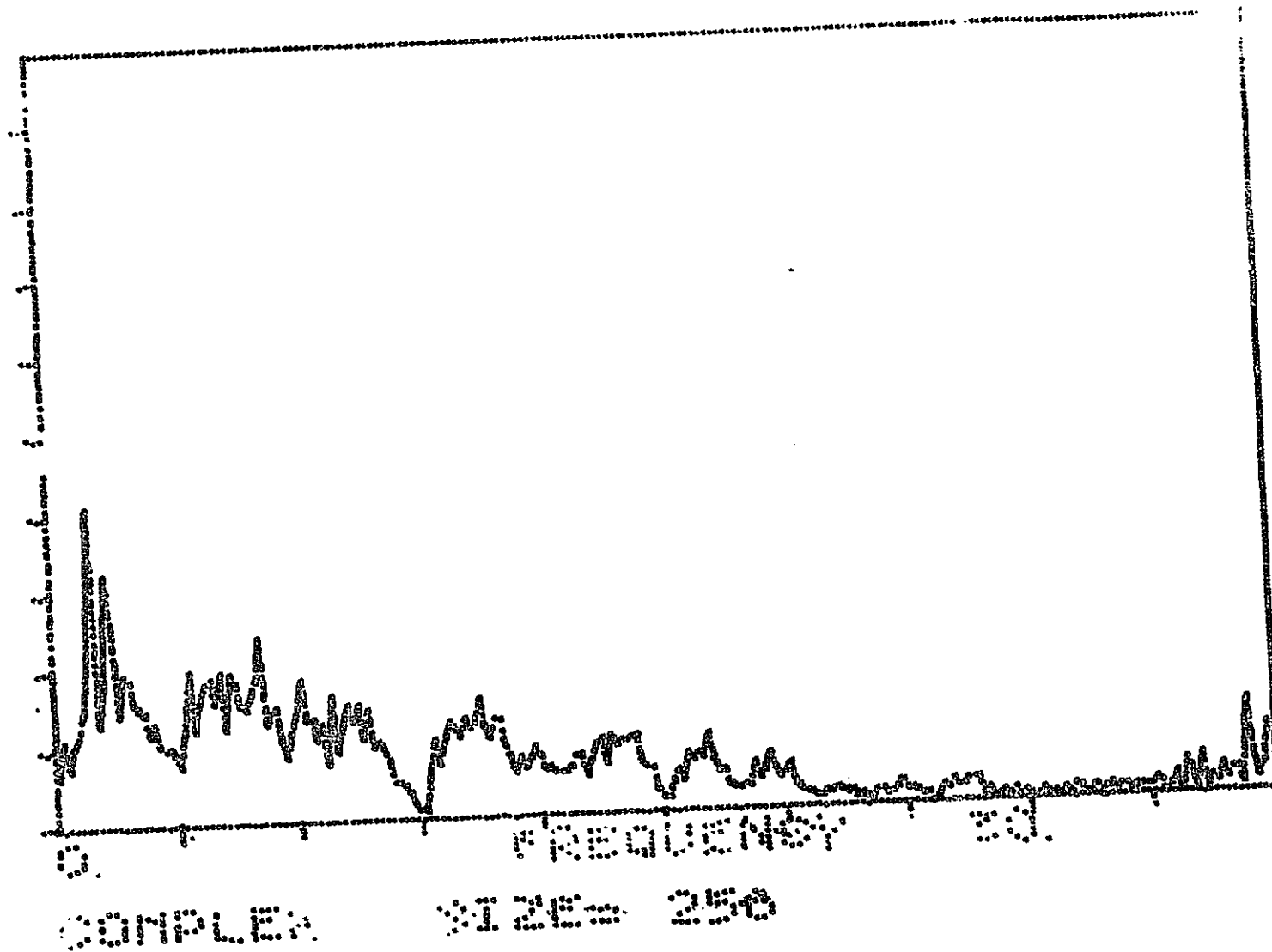
FV1/OSC.



5.

1904

0.

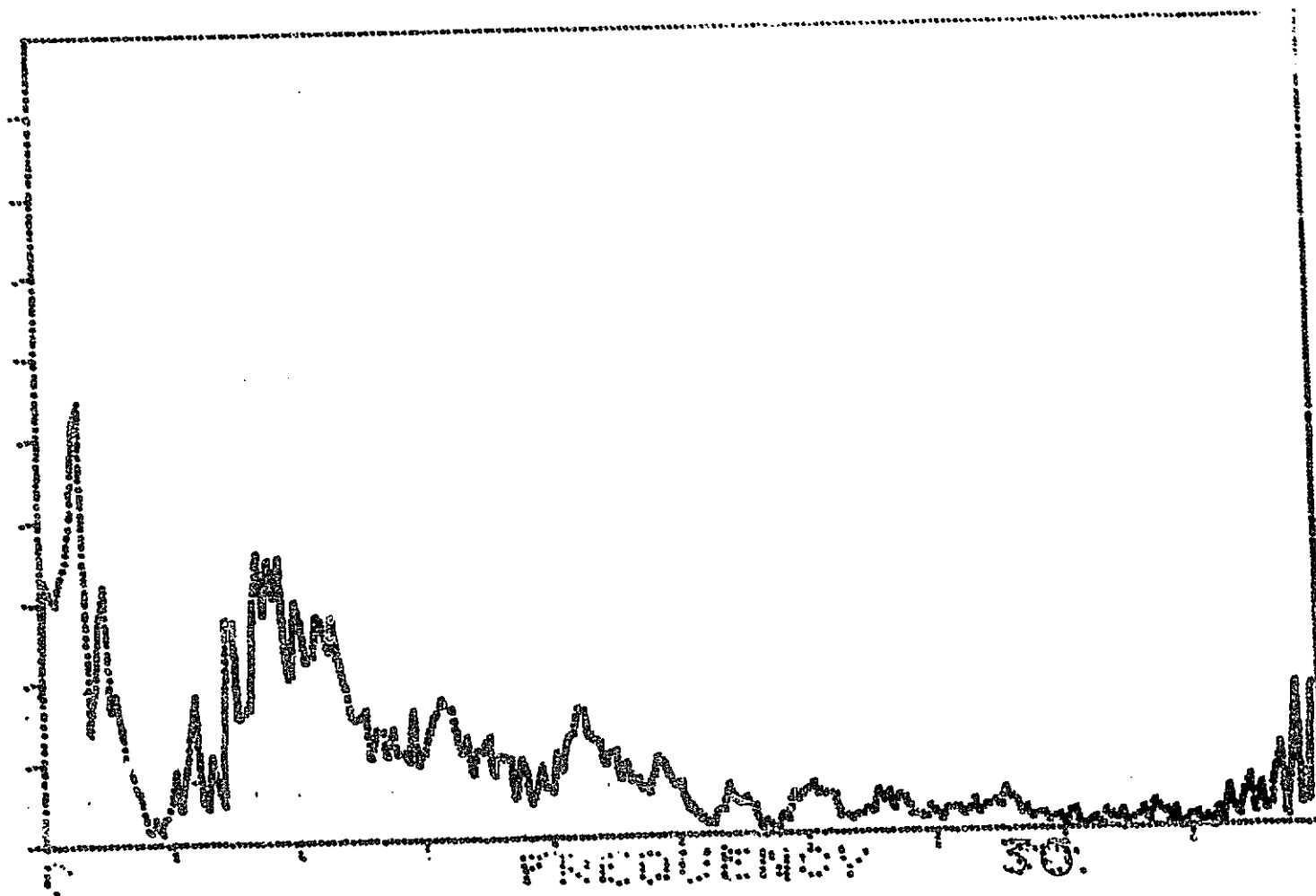


FV2/FV1

5

1924

0.



COMPLEX

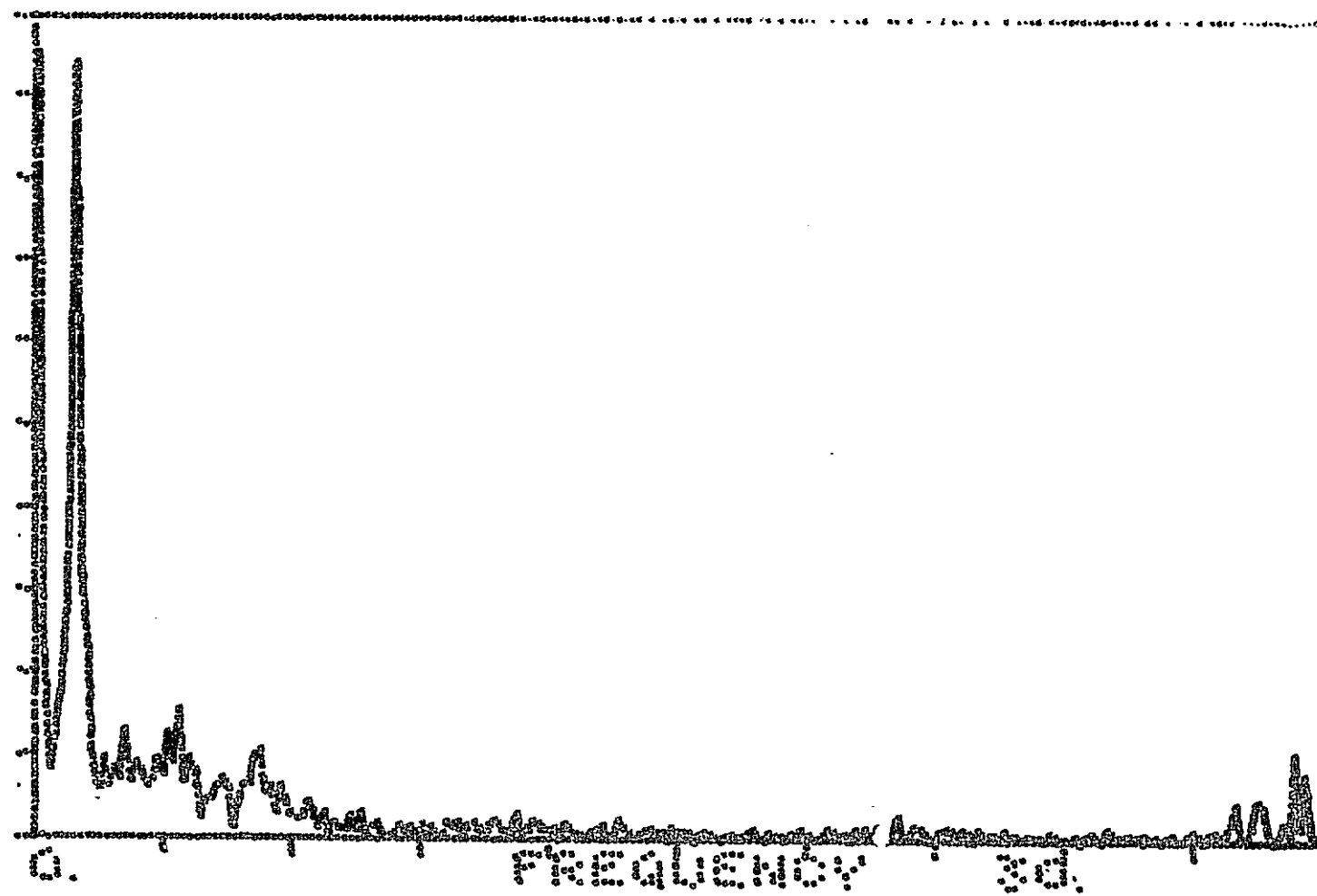
01220 256

FV4/FV1

1.

0.000000

1.



Complex

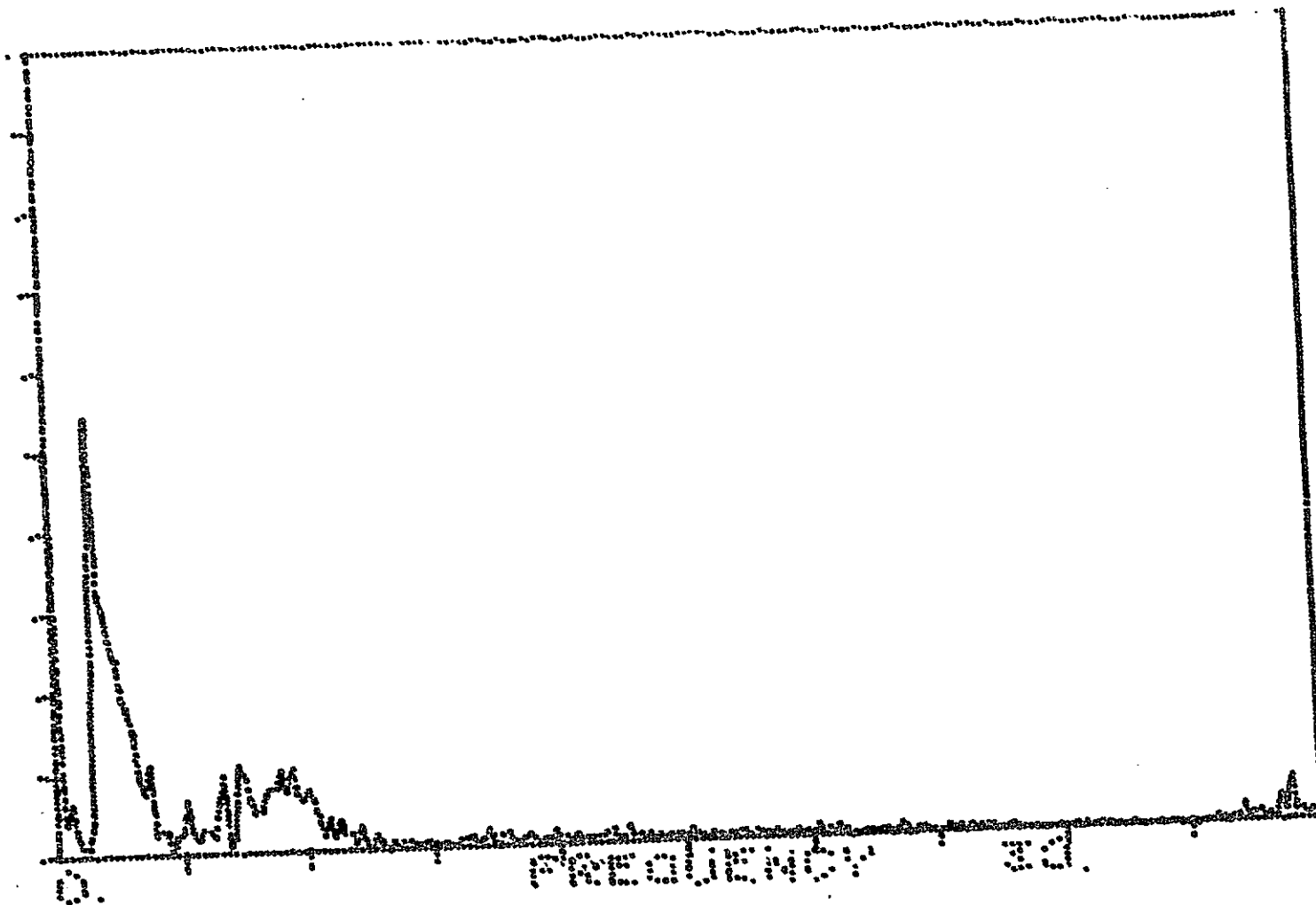
0.000000

DV1/FV1

2.

mag

0.



COMPLEX

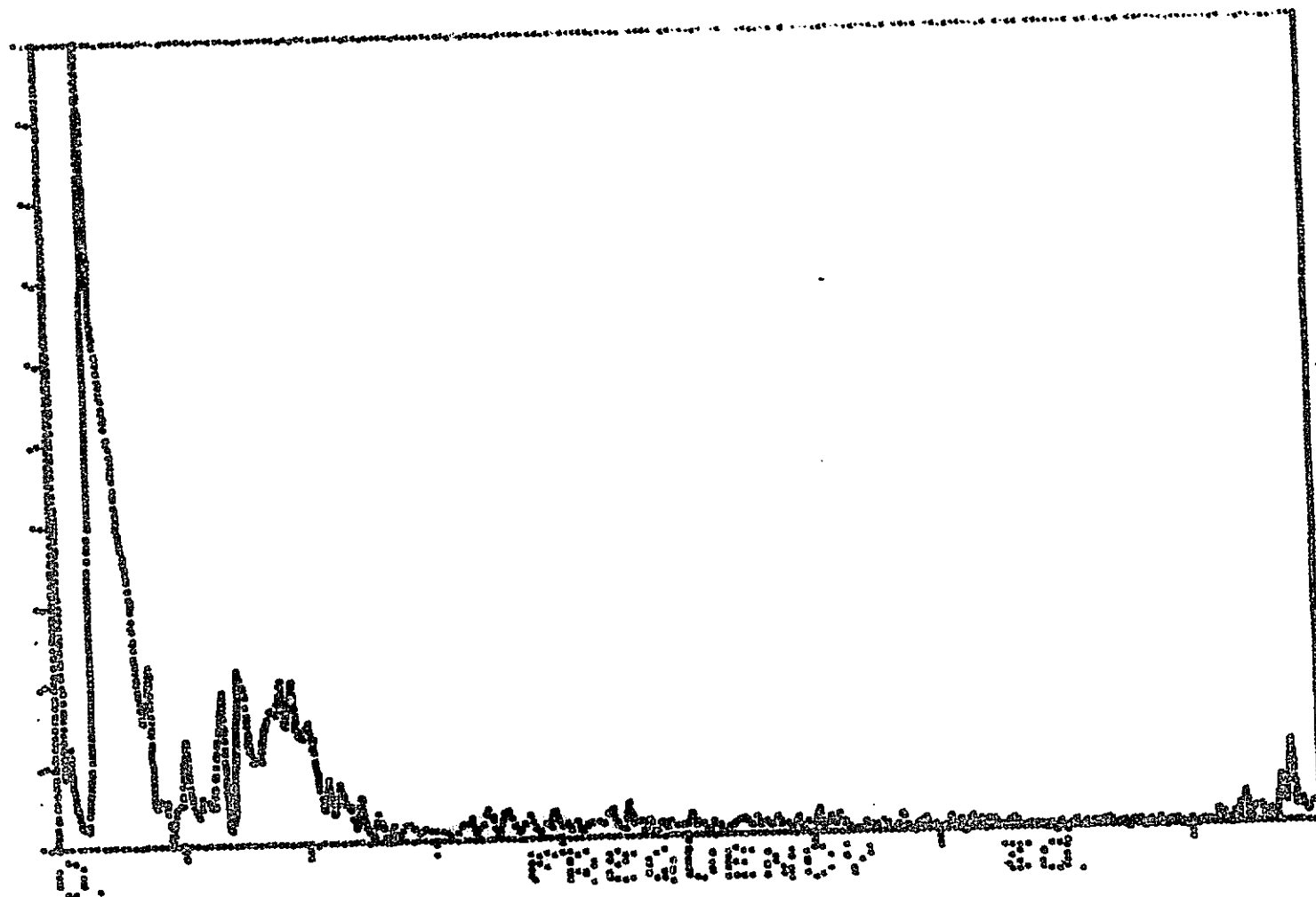
SIZE= 256

DV2/FV1

4

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COMPLEX

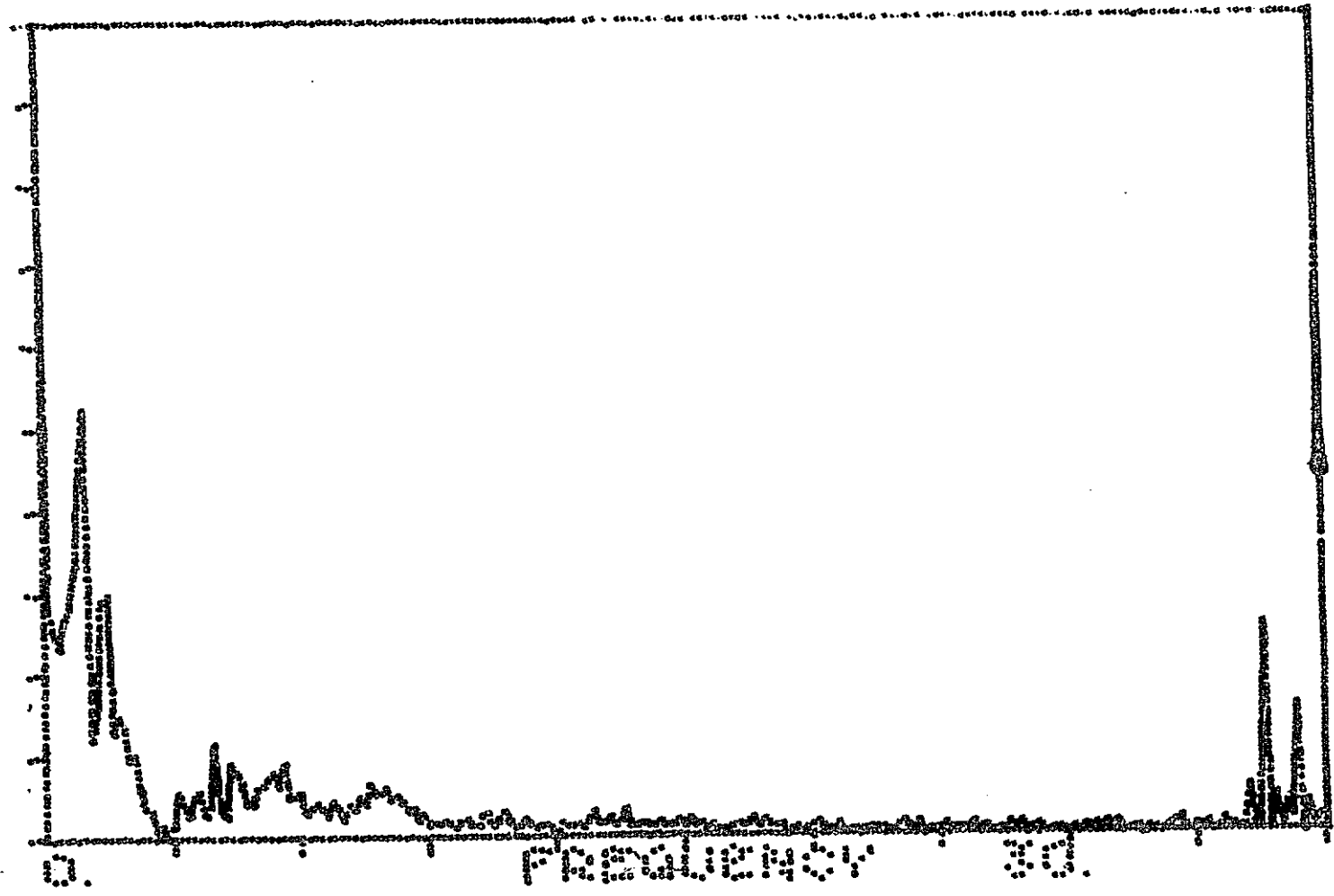
SIZE= 255

DV2/FV1

1.

NAME

0.



Complex

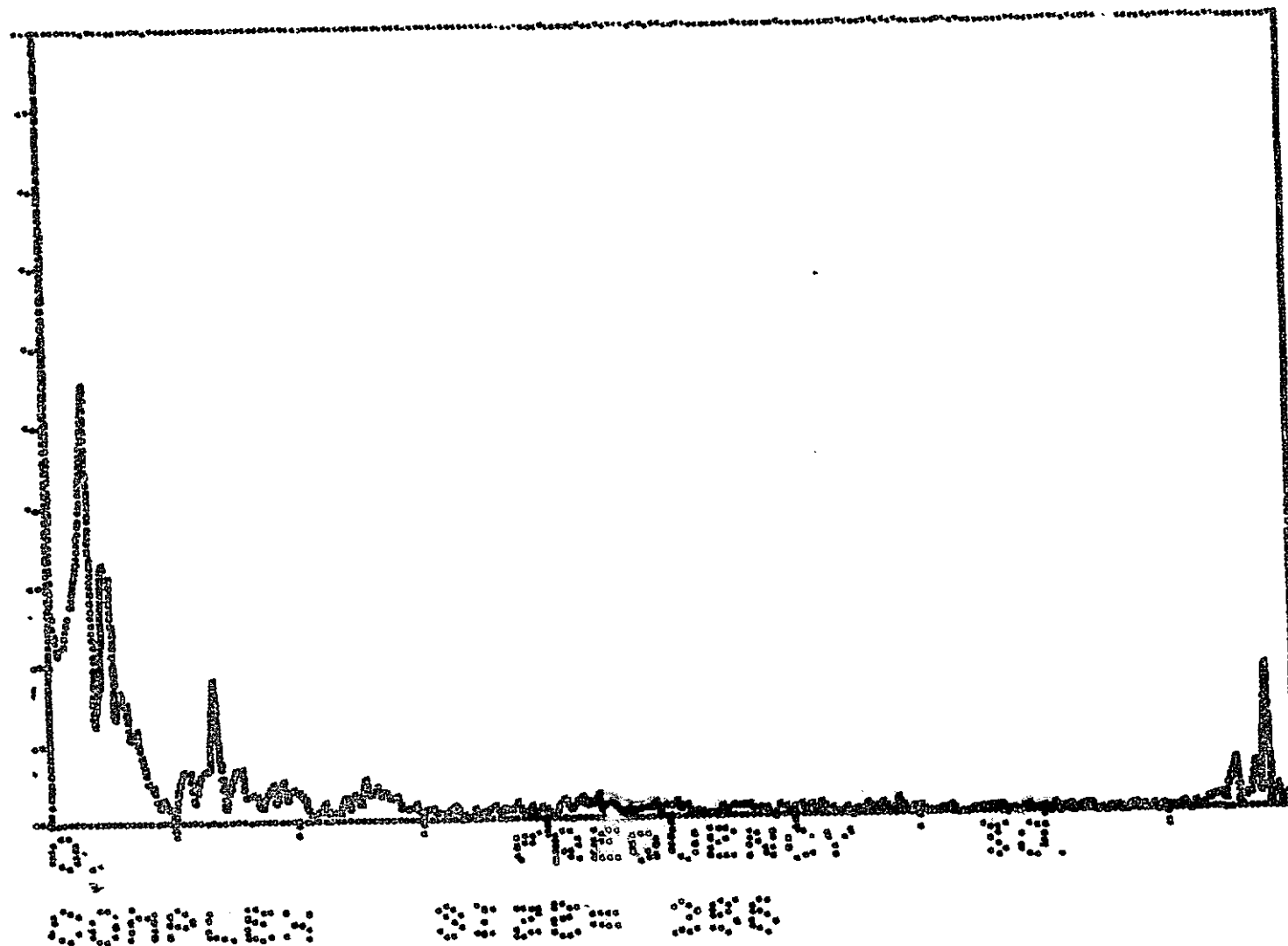
size 256

DV3/FV1

4.

88888888

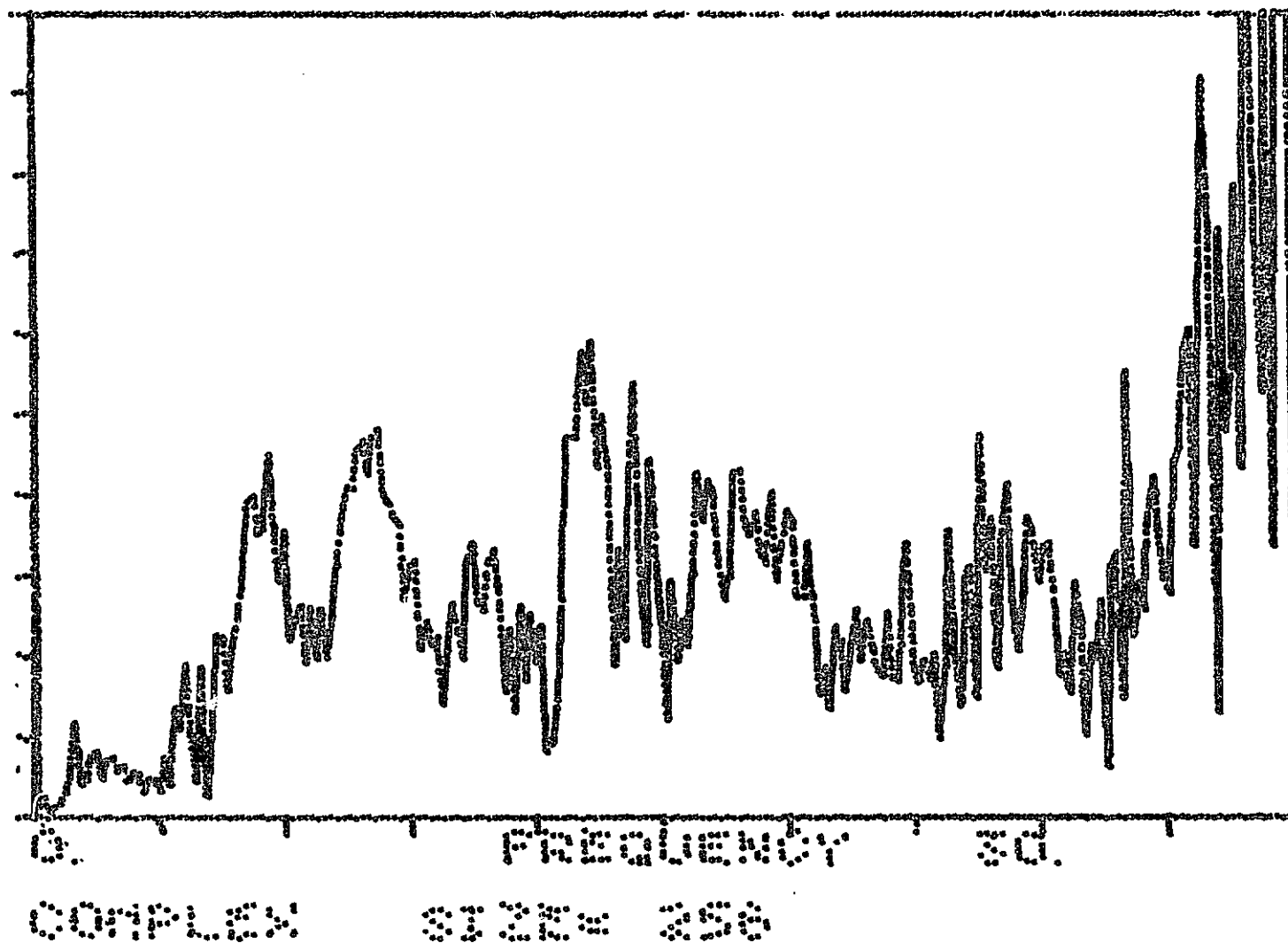
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1.

1960

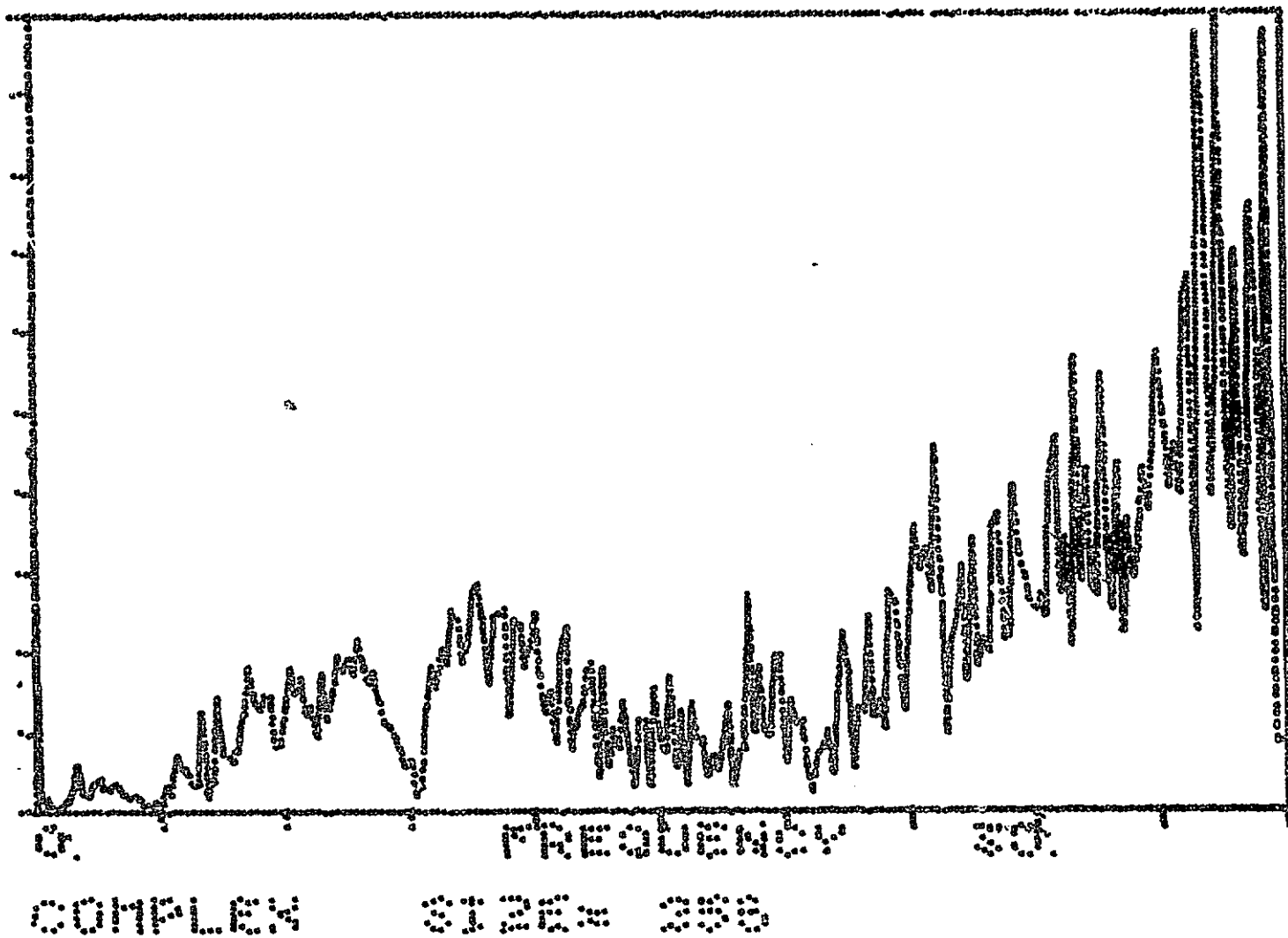
2.



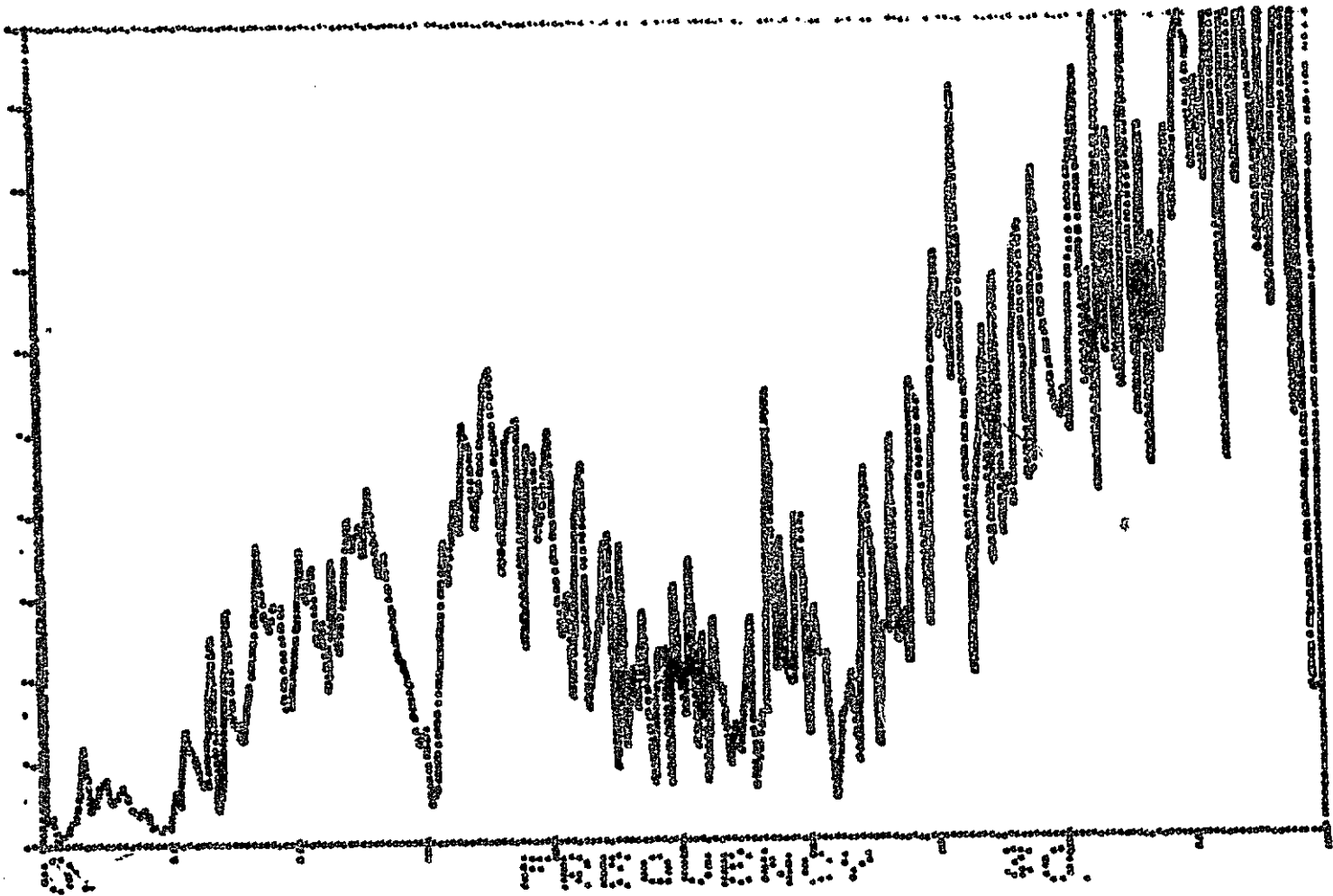
2.

1983

0.



AV2/FV1



COMPLEX

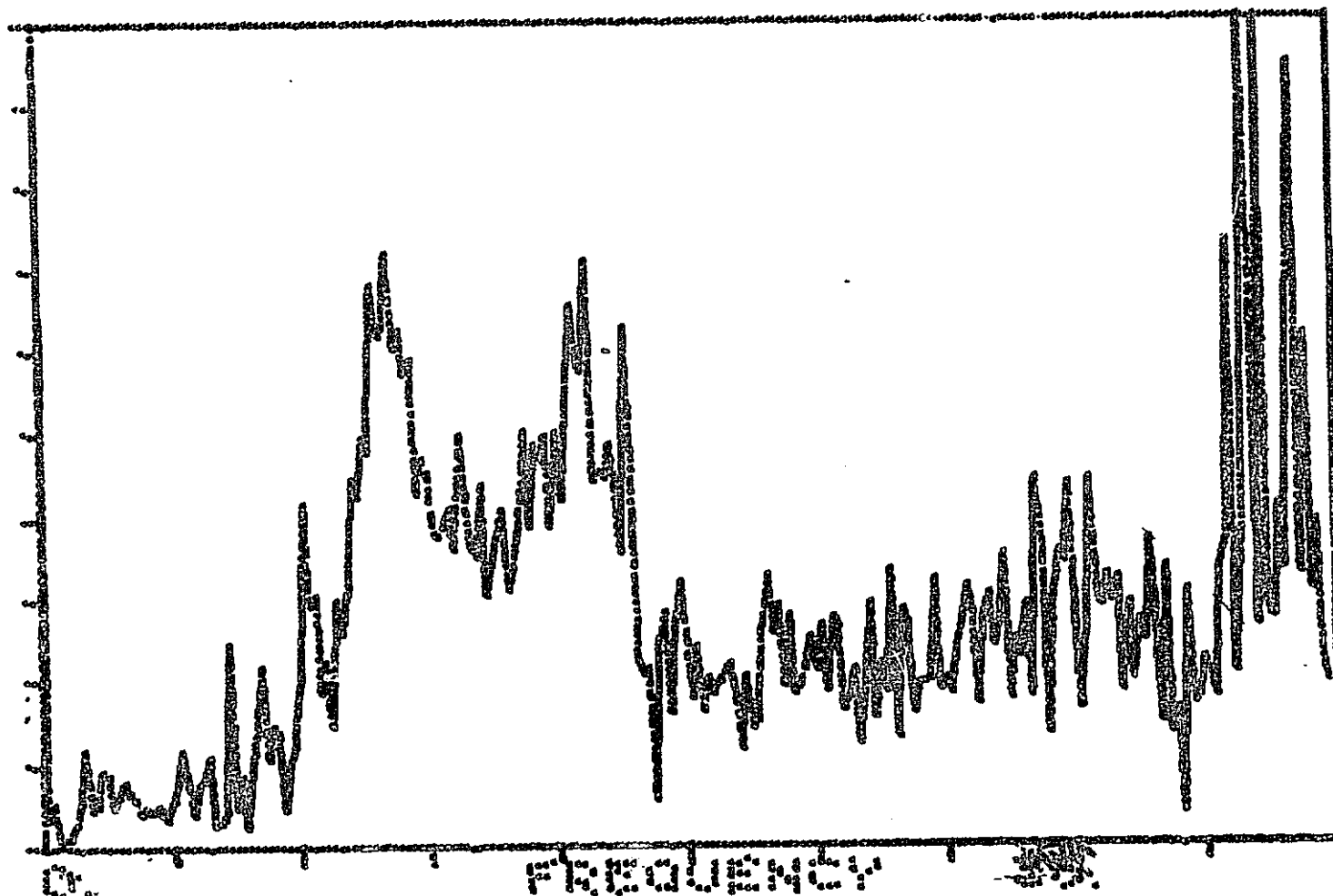
FREQUENCY

AV2/FV1

1.

1200

0.



Complex

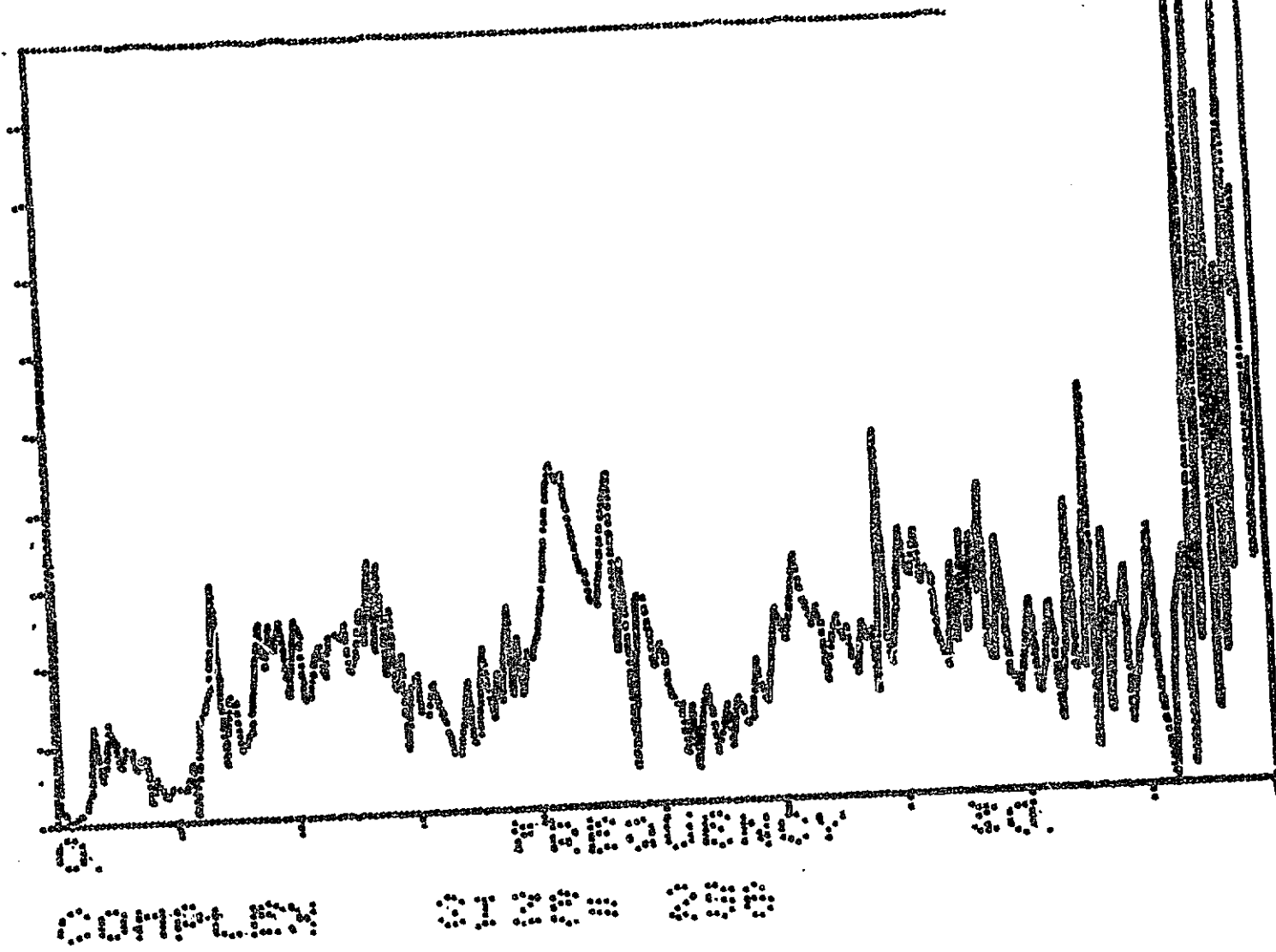
01234 356

AV3/FV1

1

1103

0.

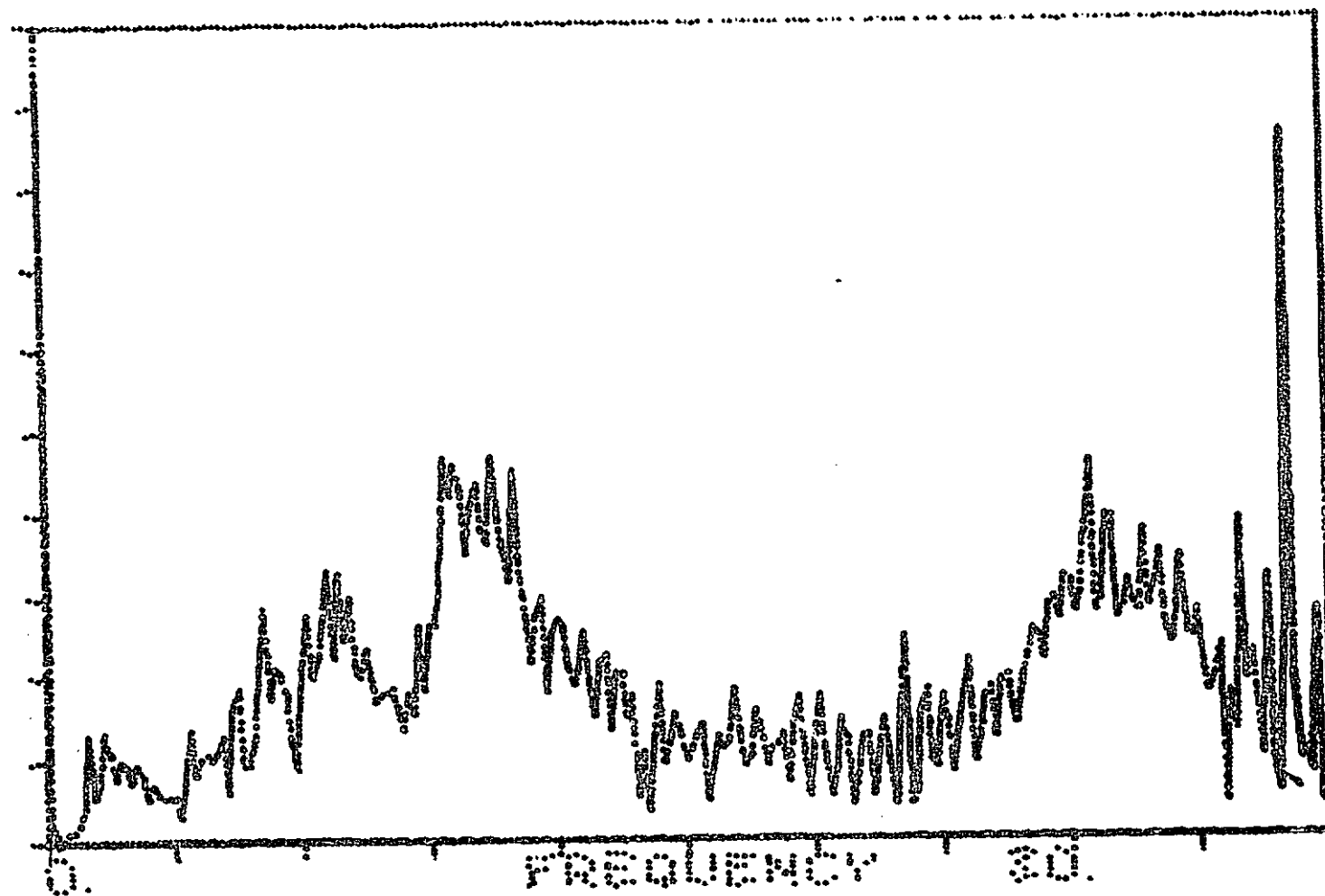


AV4/FV1

1.

1969

Q.



COMPLEX

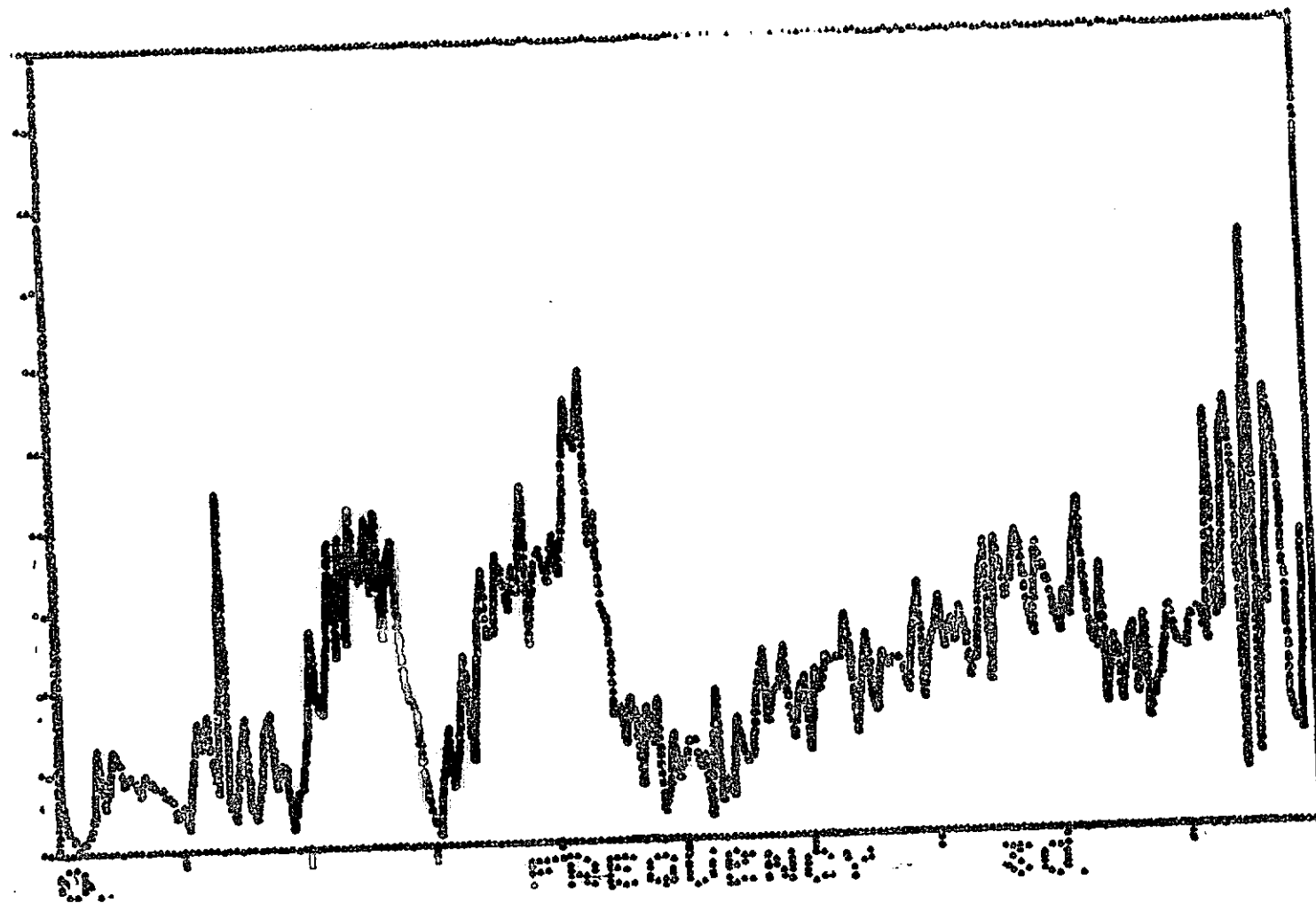
SIZE= 256

AV5/FV1

1.

mean

0.



COMPLEX

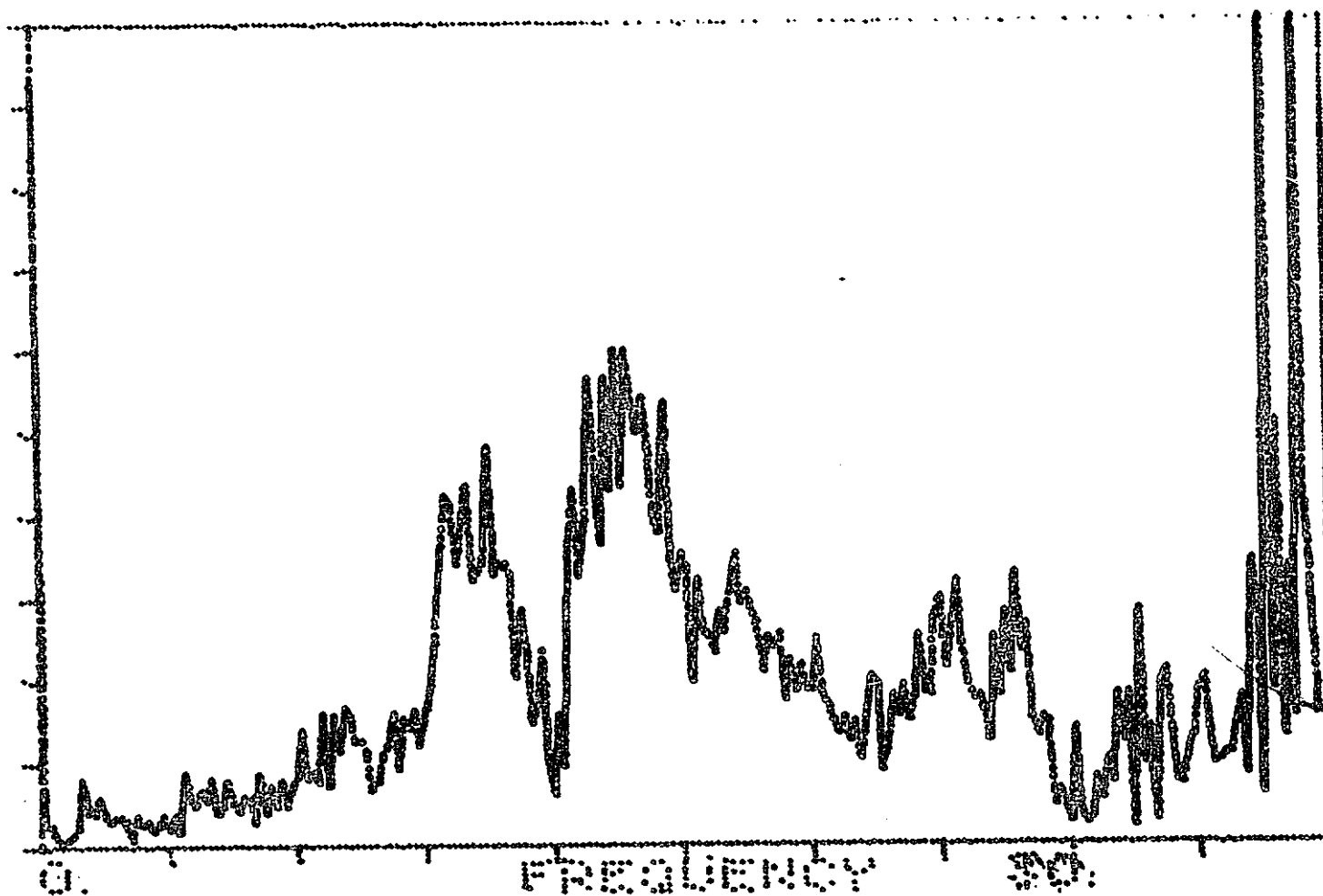
SIZE= 256

AV6/FV1

1.

1968

0.



COMPLEX

SIZE= 256

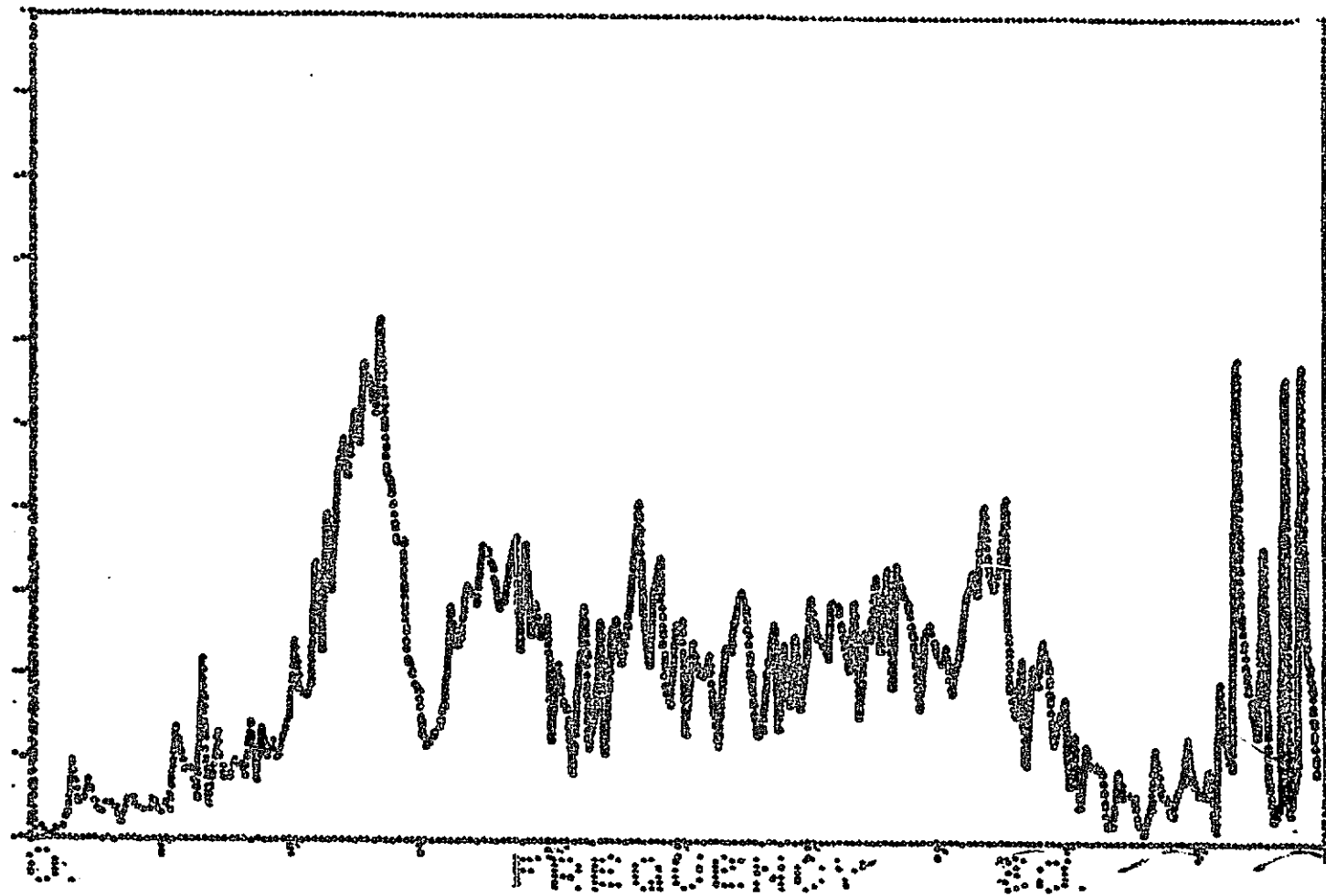
AL1/FV1

4.

WROX

2-1

0.



COMPLEX

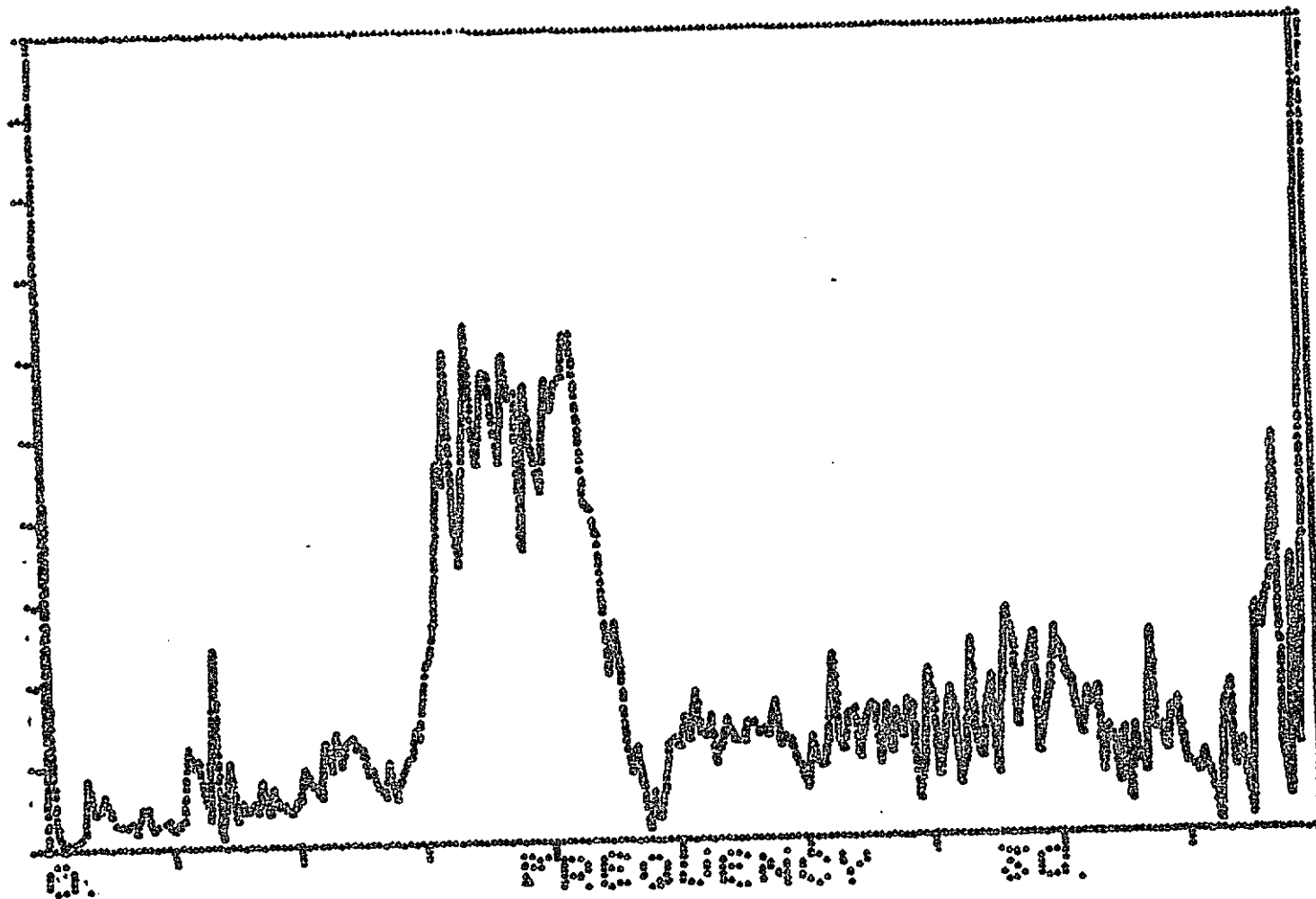
SIZE: 256

AL2/FV1

4.

1968

2.



COMPLEX

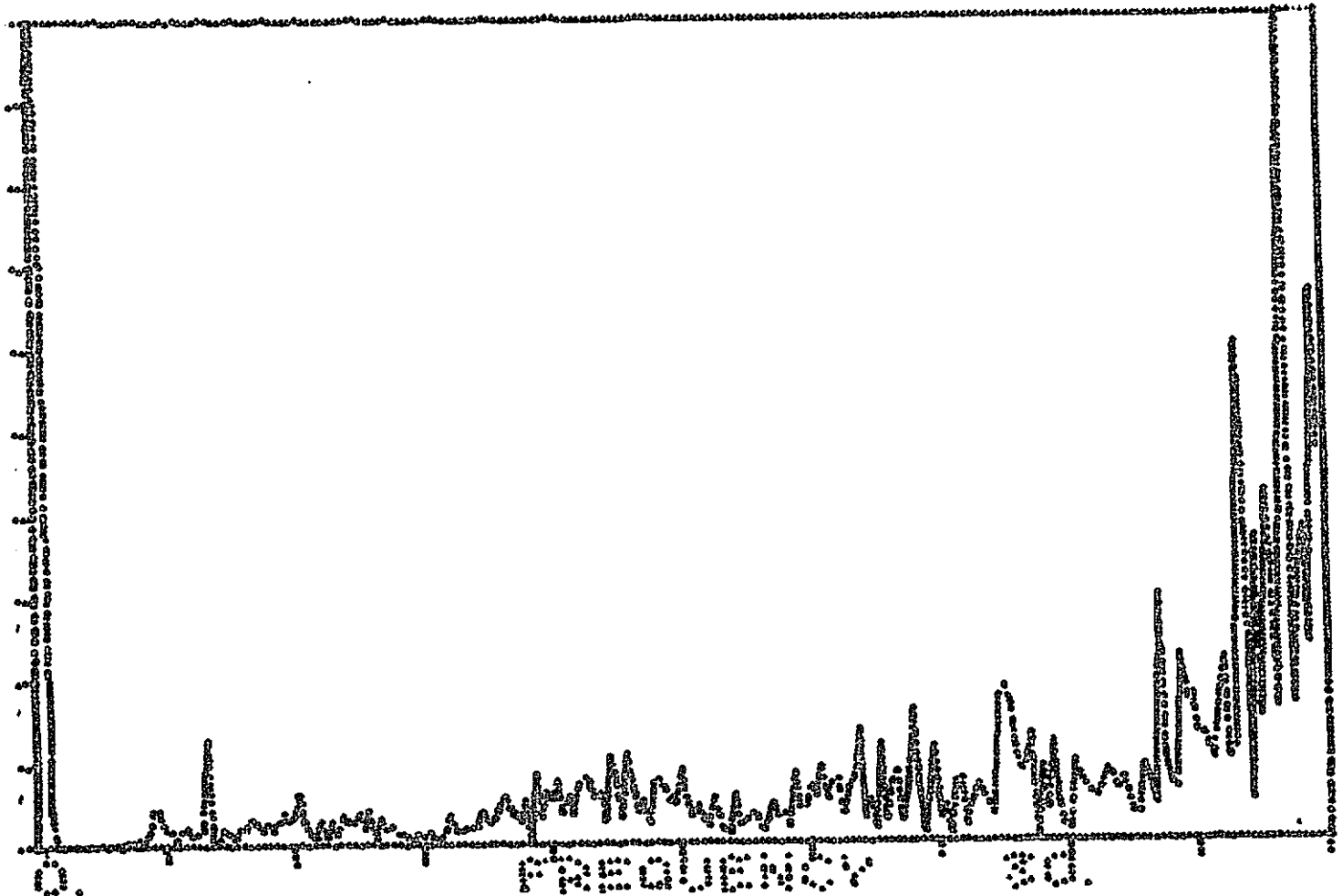
01234 234

AL3/FV1

1.

mm

0.



COMPLEX

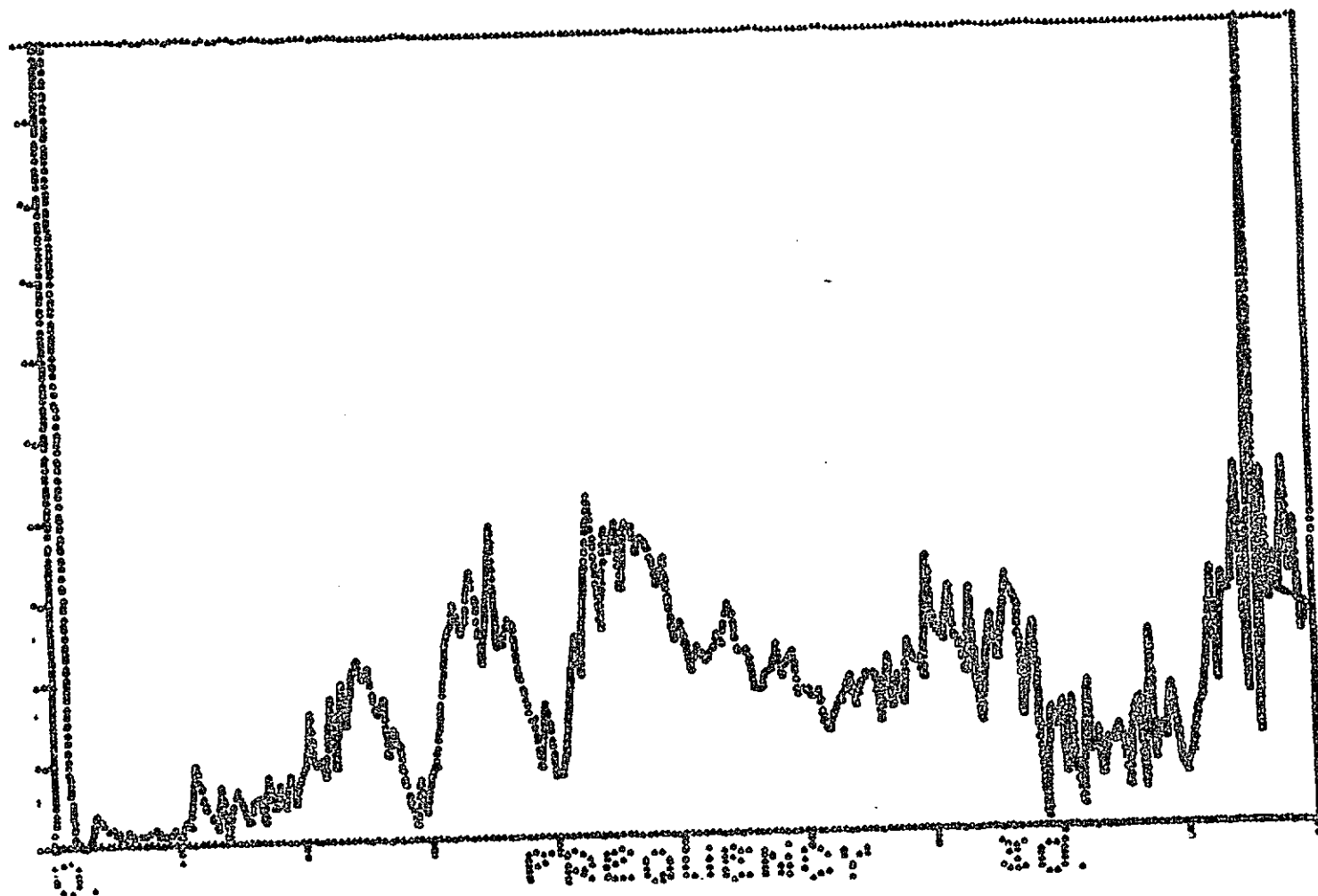
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AL6/FV1

4.

1961

0.



COMPLEX

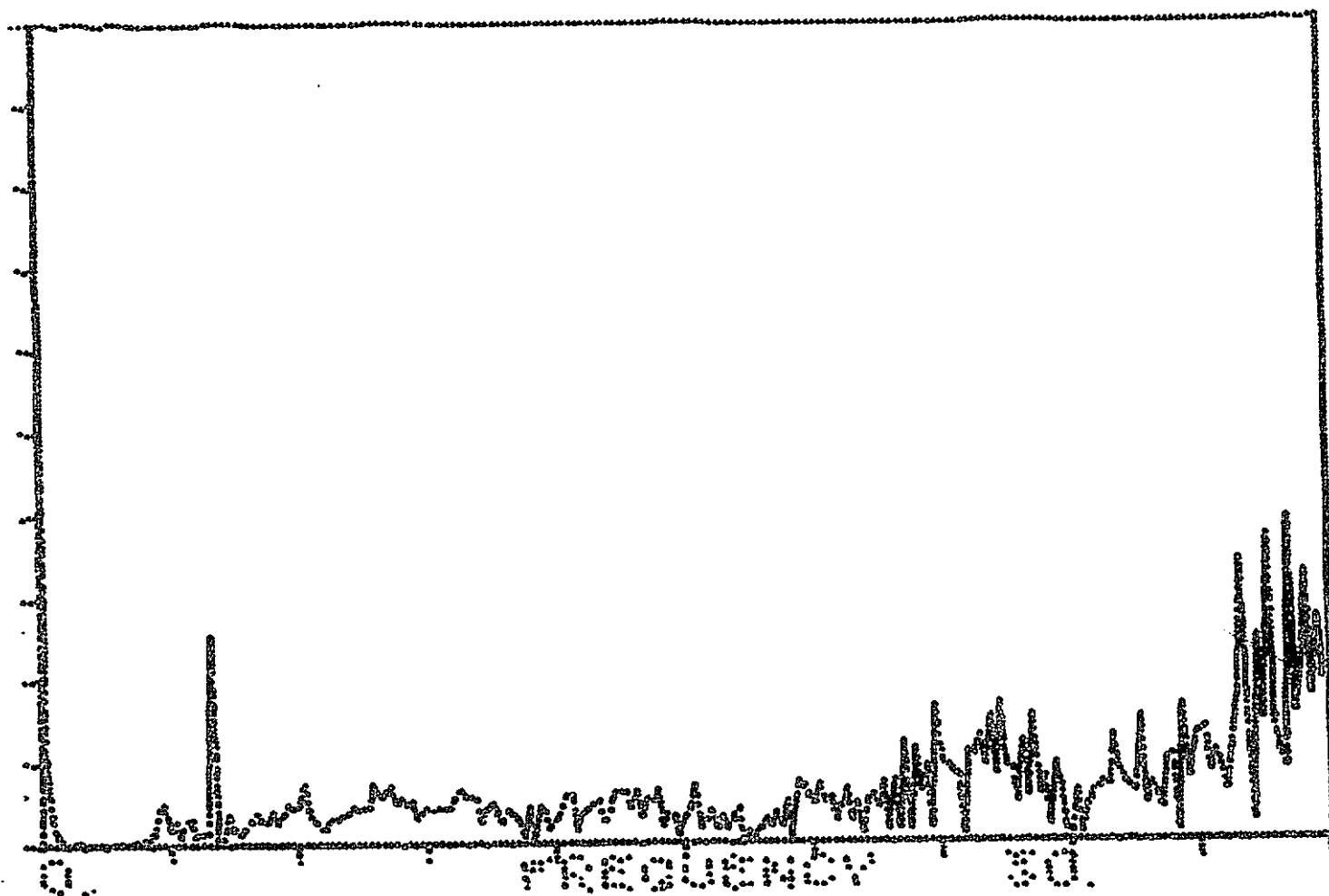
SIZE = 256

AL7/FV1

1.

1950

0.



COMPLEX

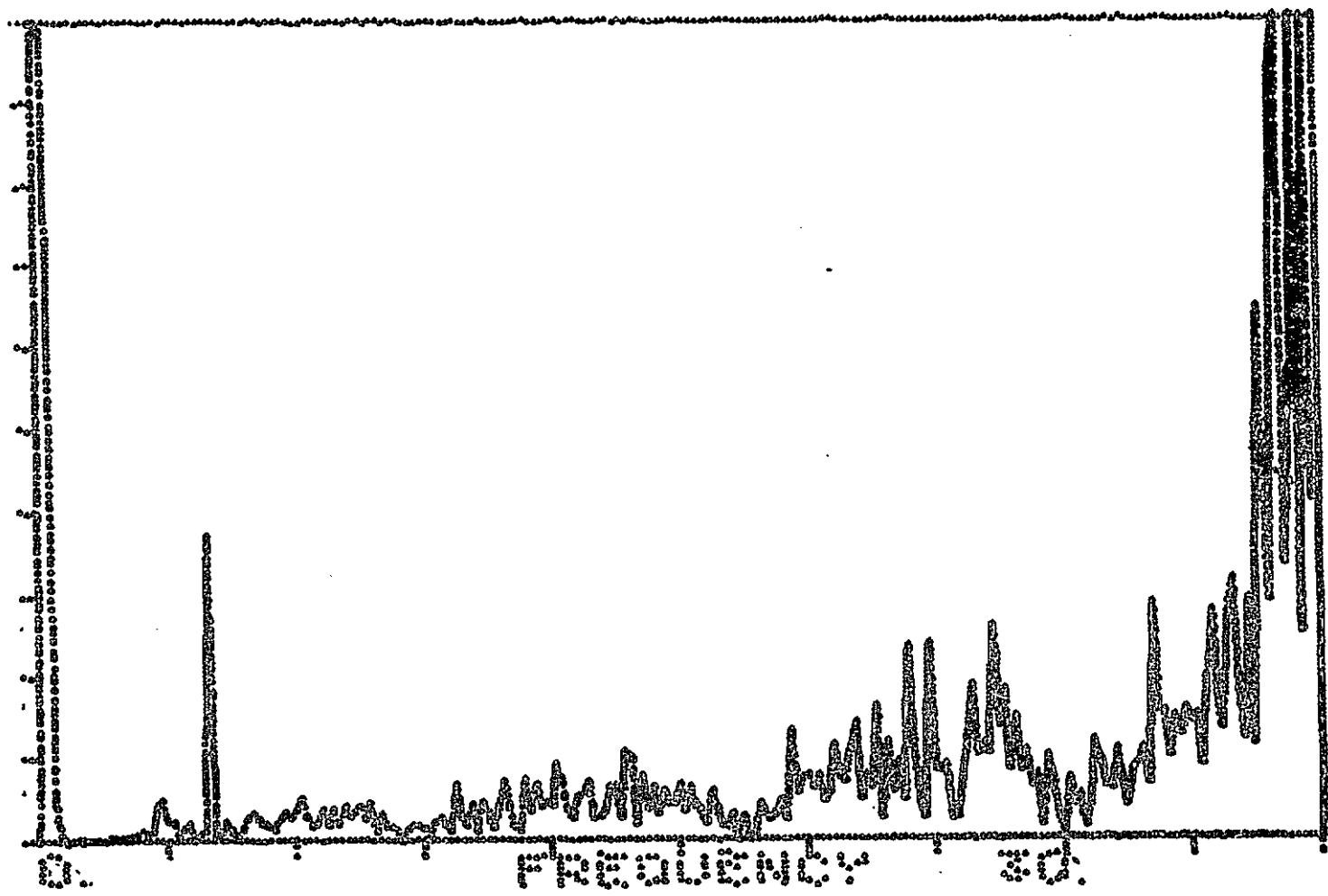
5132 250

AL11/FV1

4.

mean

2.



COMPLEX

01230 000

AL4/FV1

COPIES

5123 535

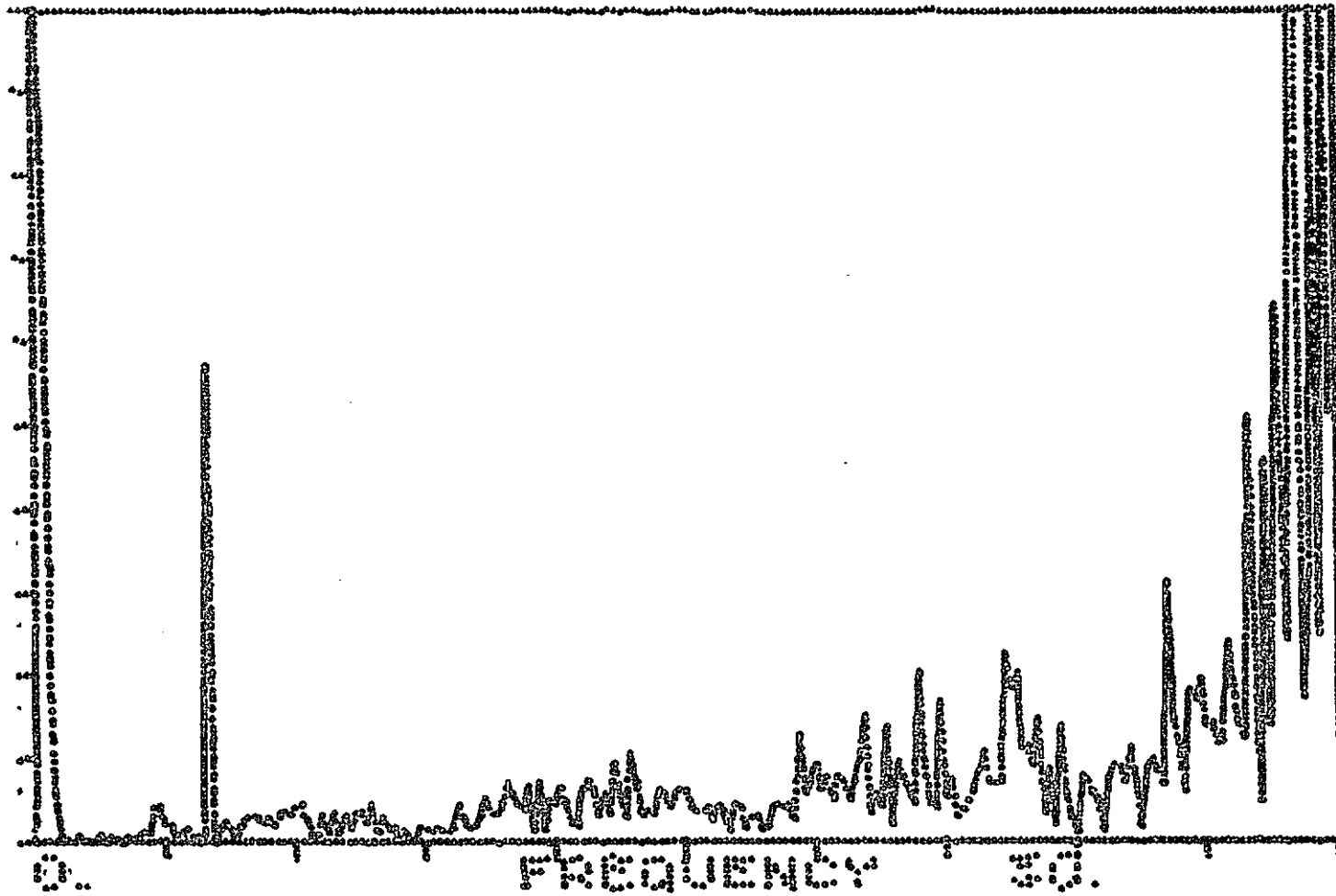
SECRET

50.

4

2000

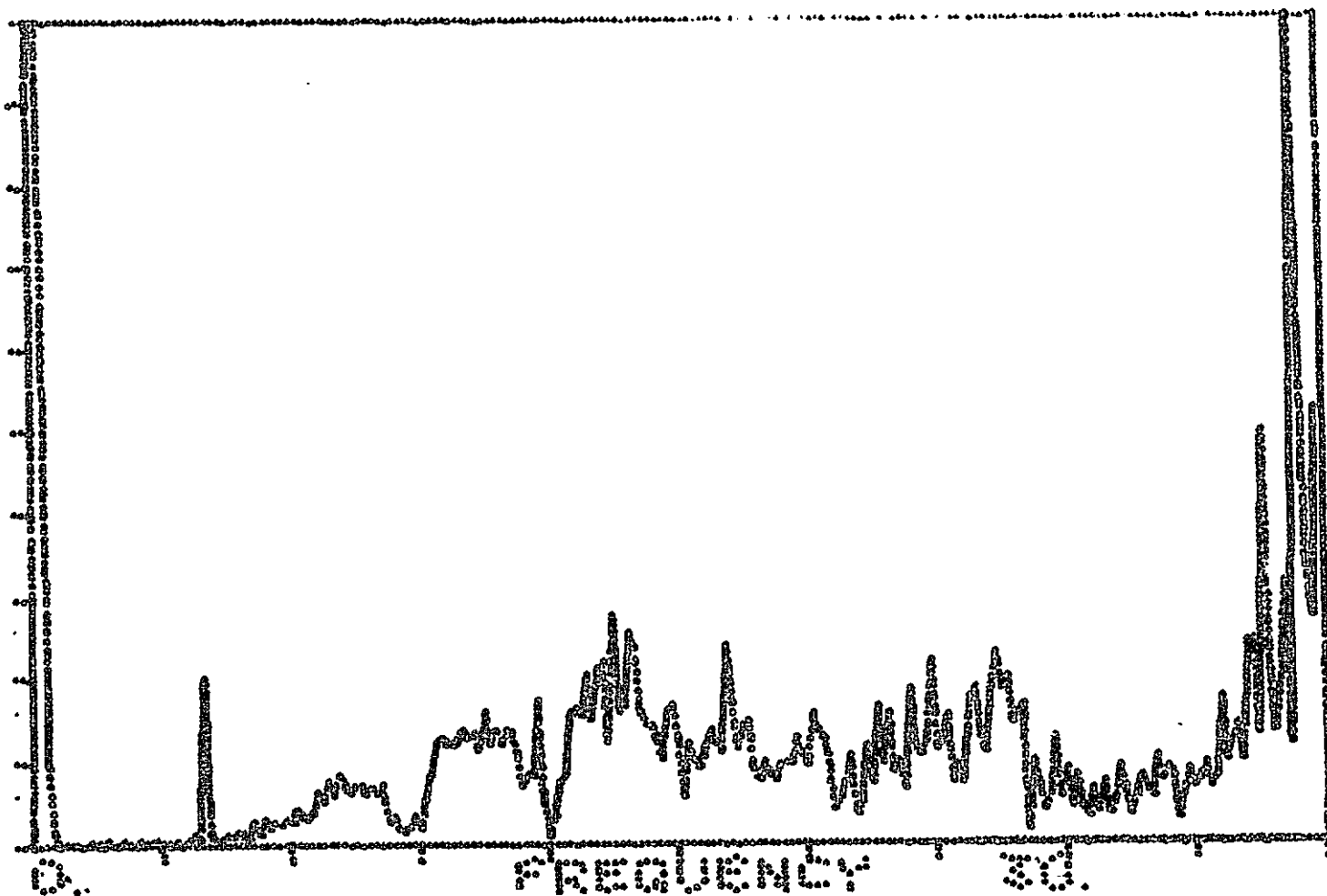
2



COMPLEX

01:33:23.2

AL8/FV1



COMPLEX

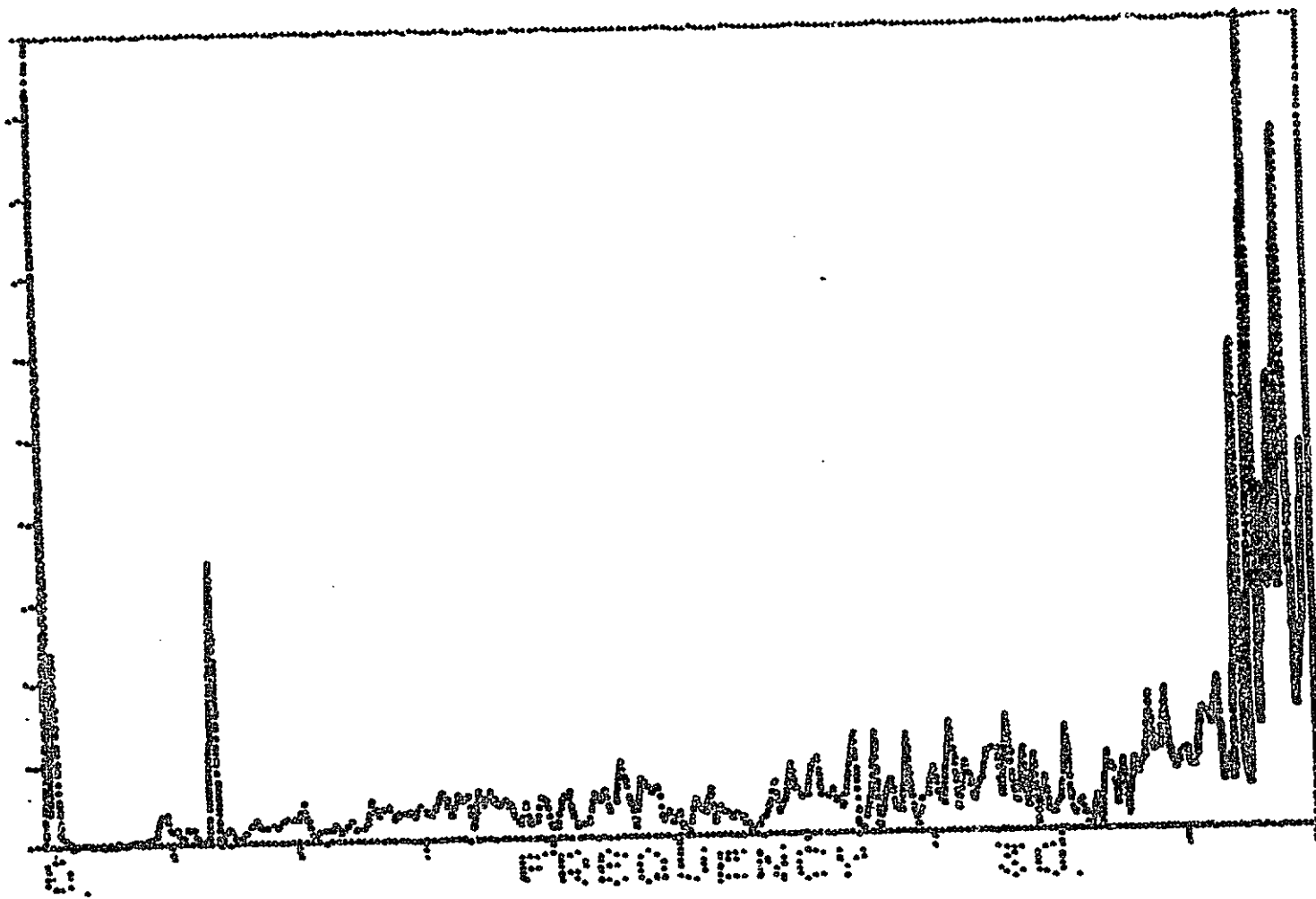
01234 056

AL9/FV1

1.

1968

0.



COMPLEX

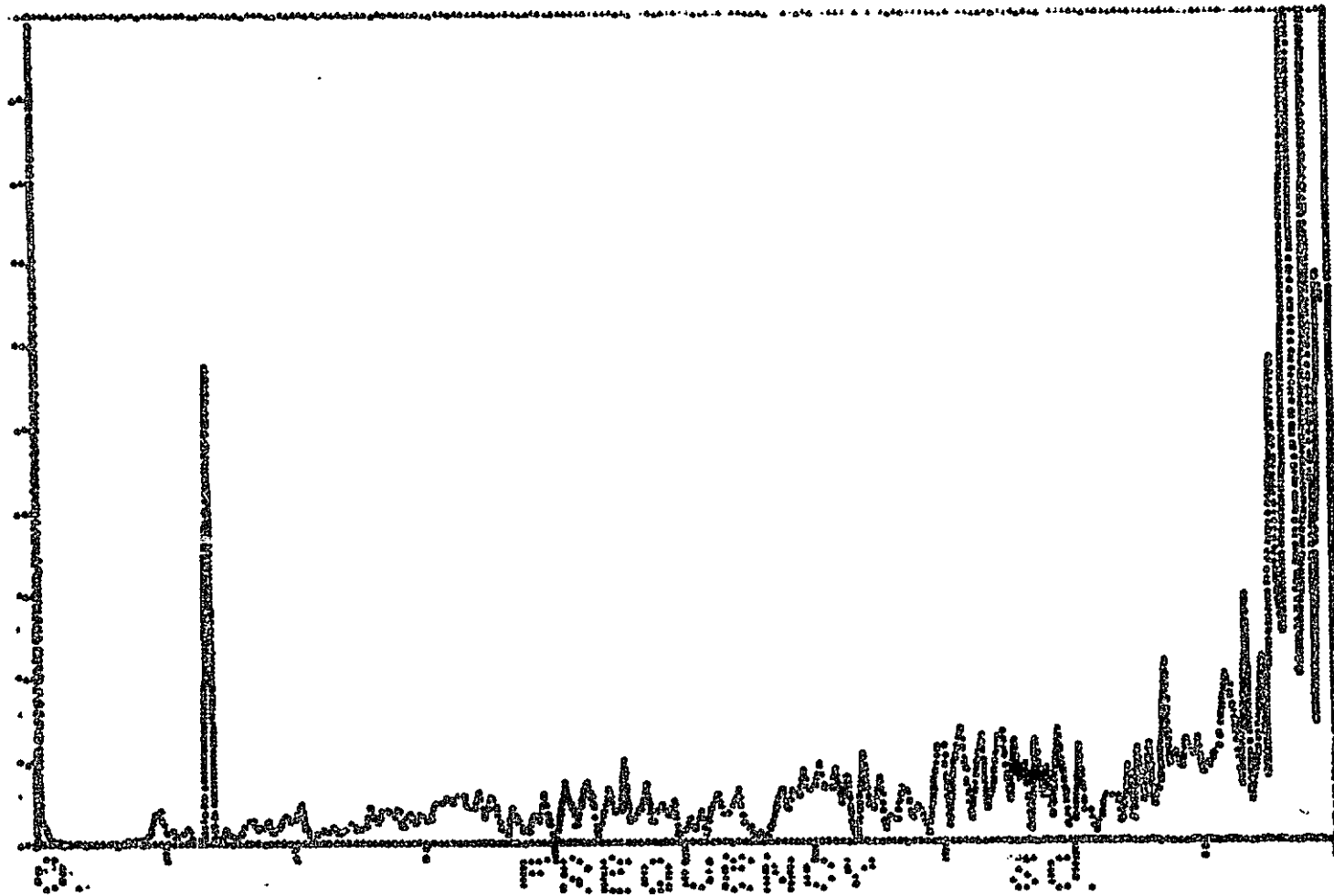
SIZE= 256

AL10/FV1

1.

man

a.



COMPLEX

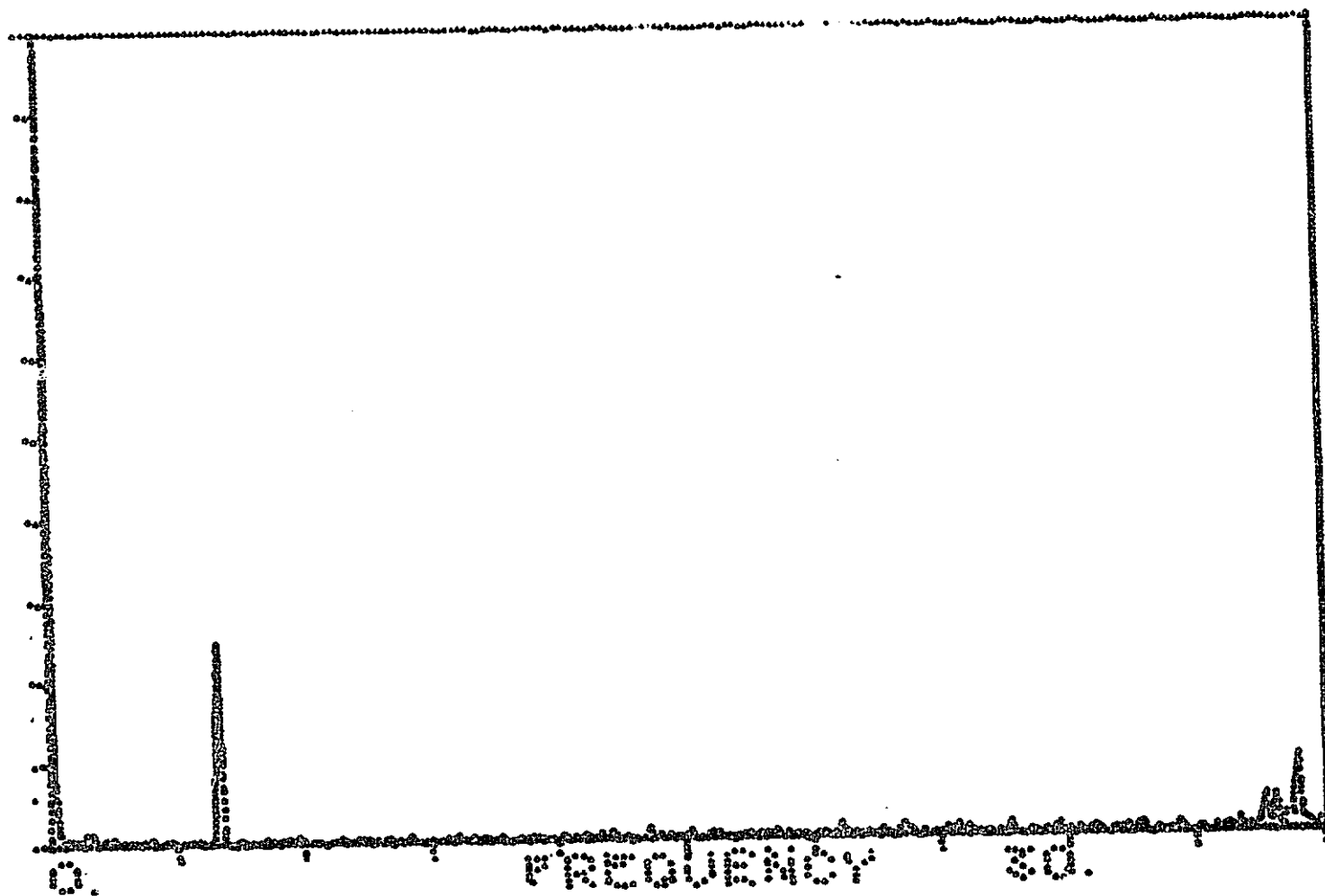
SIZE= 255

AL12/FV1

1.

max

0.



COMPLEX

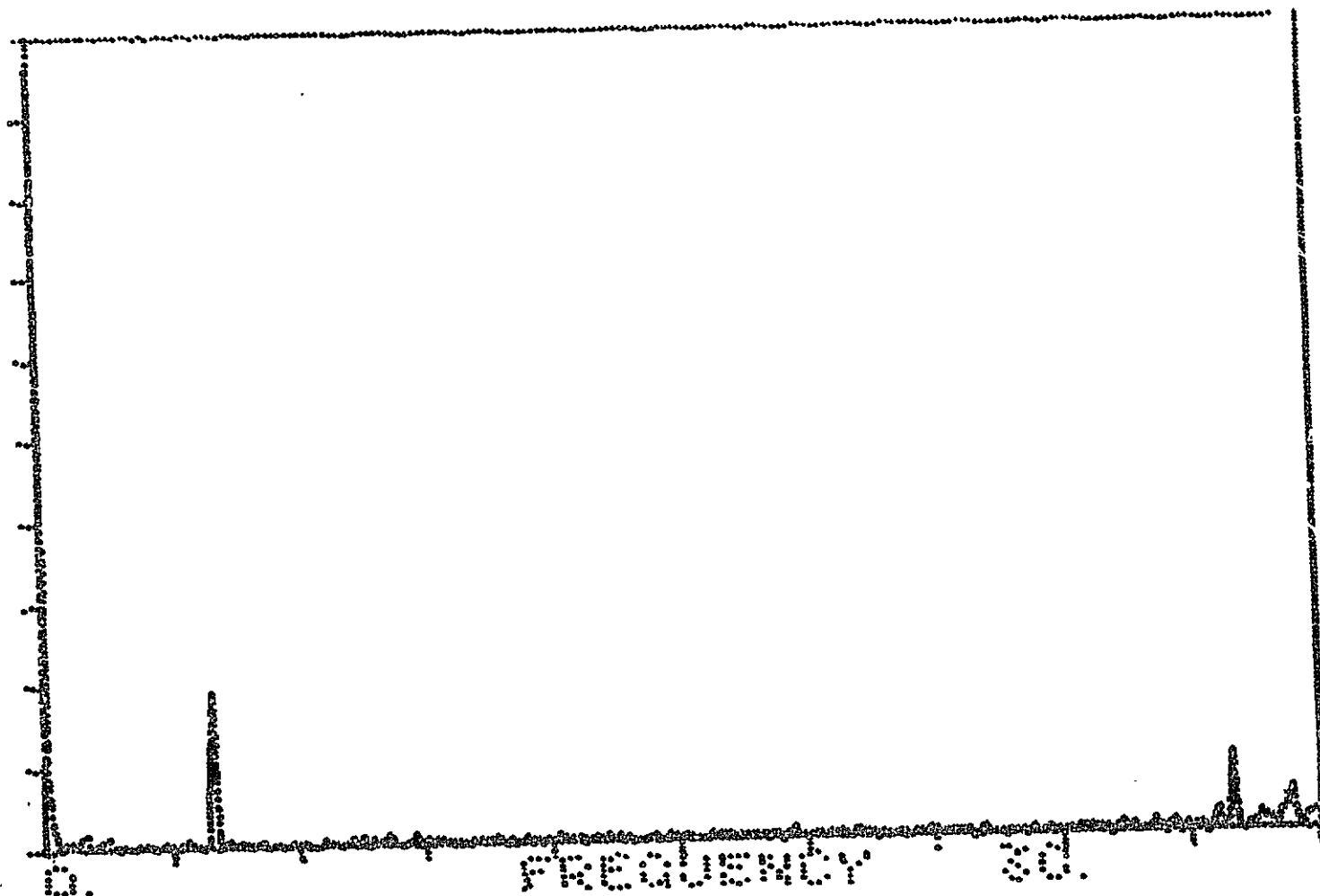
81250 256

DL1/FV1

1.

non

2.



COMPLEX

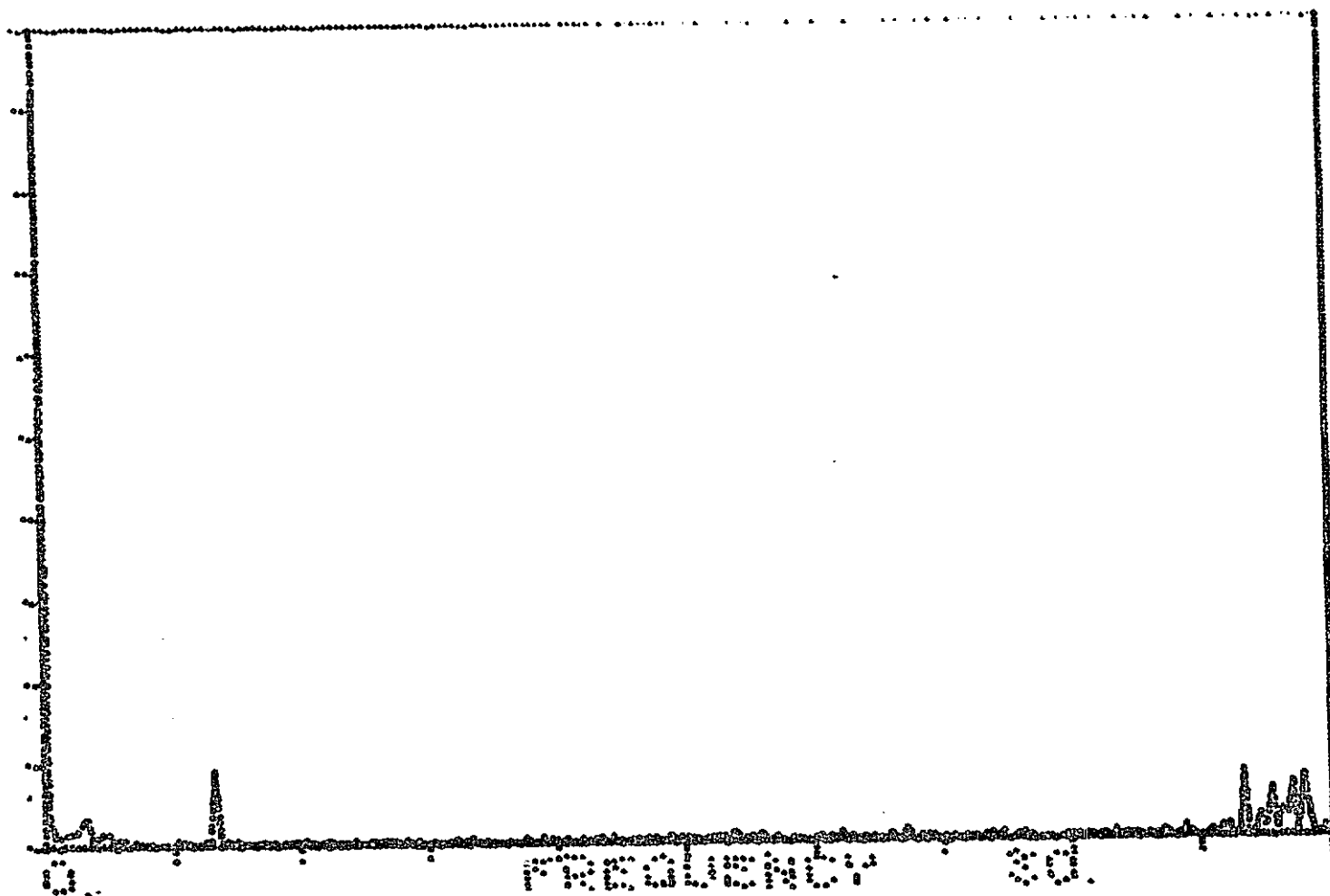
SIZE 128

DL2/FV1

1.

1000

0.



COMPLEX

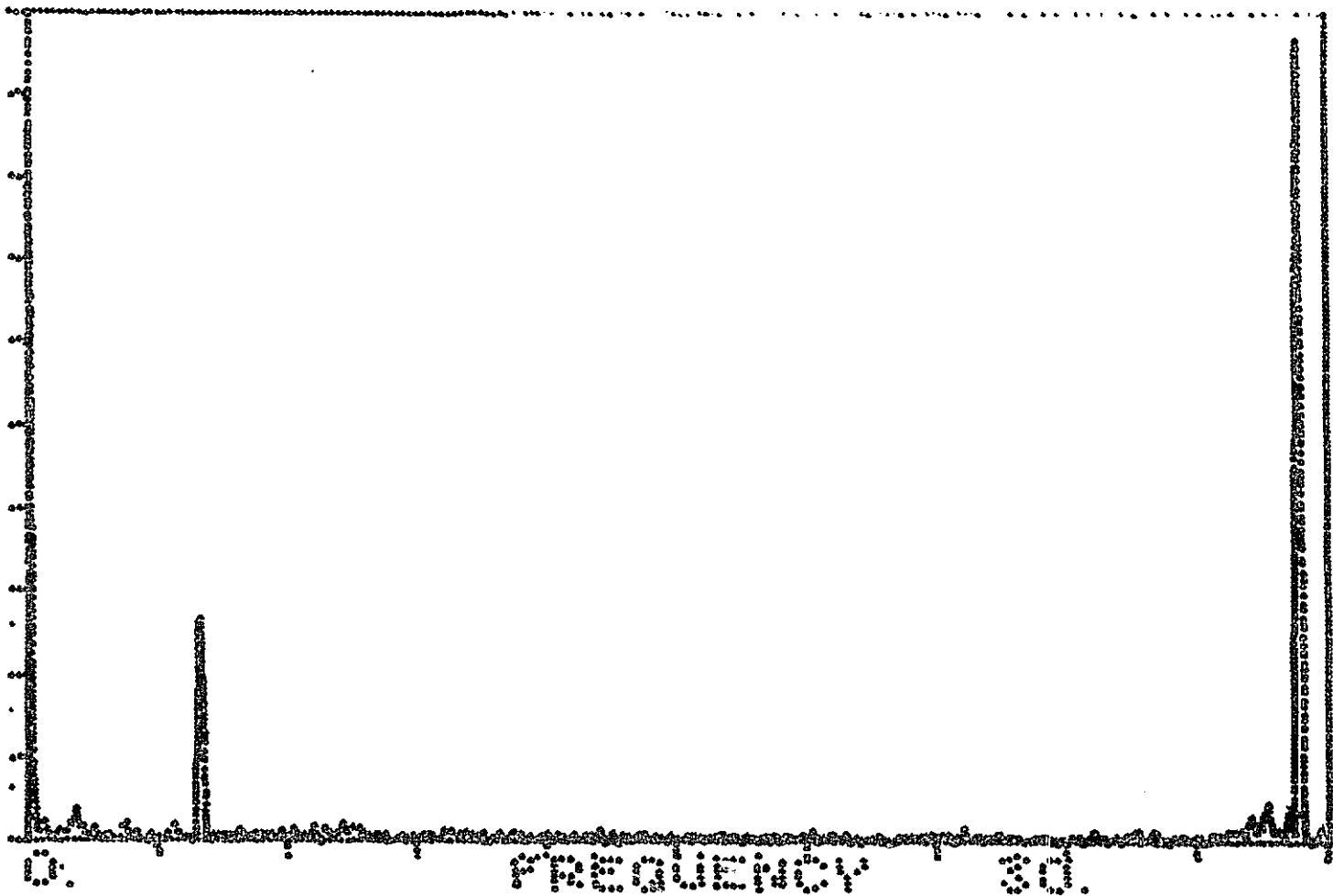
SIZE: 256

DL3/FV1

4.

1000

0.

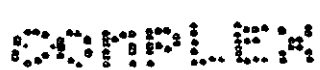


Complex

512 256

DL4/FV1

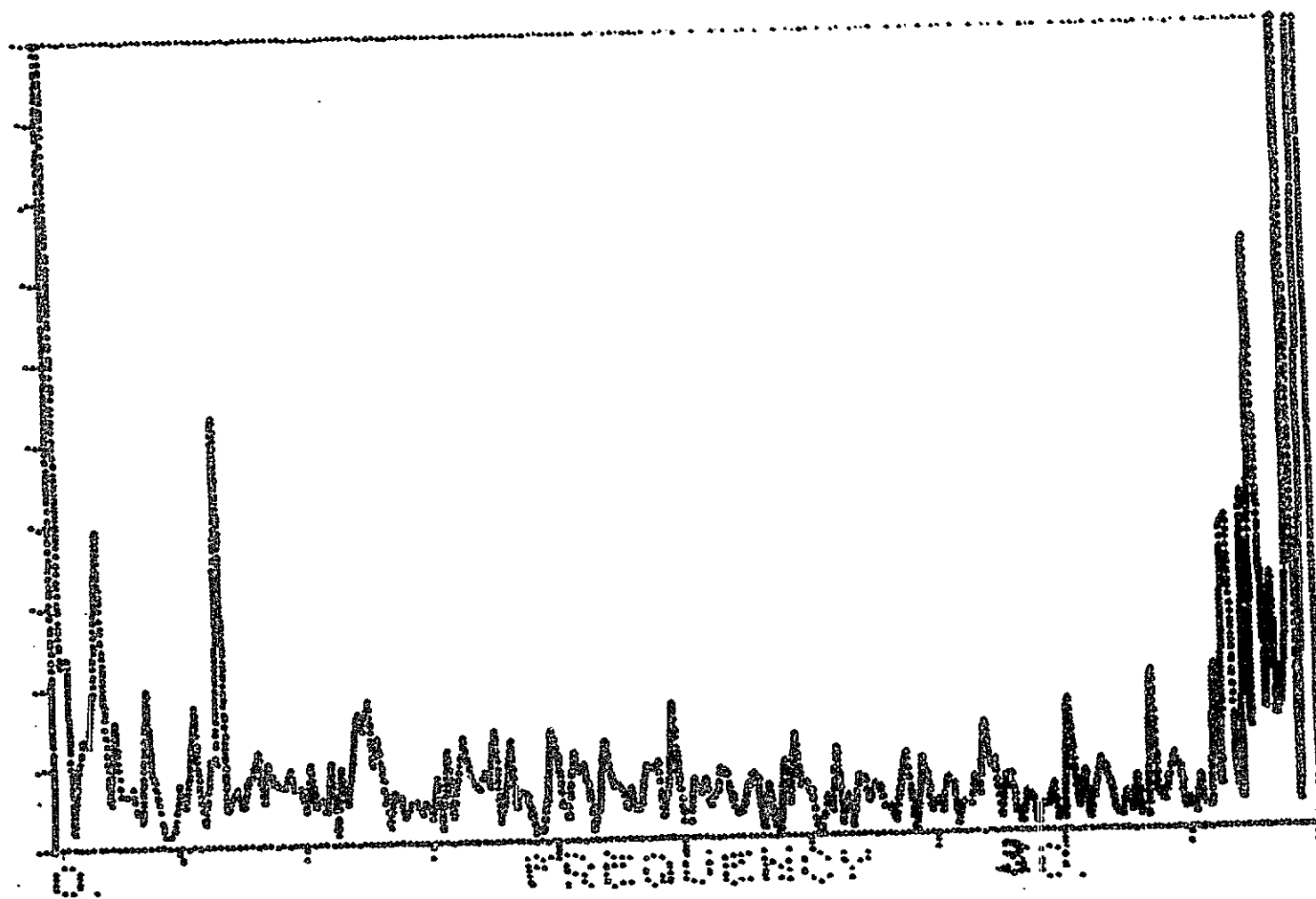
● ● ● ● ●



03 25 25 5

DL5/FV1

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COMPLEX

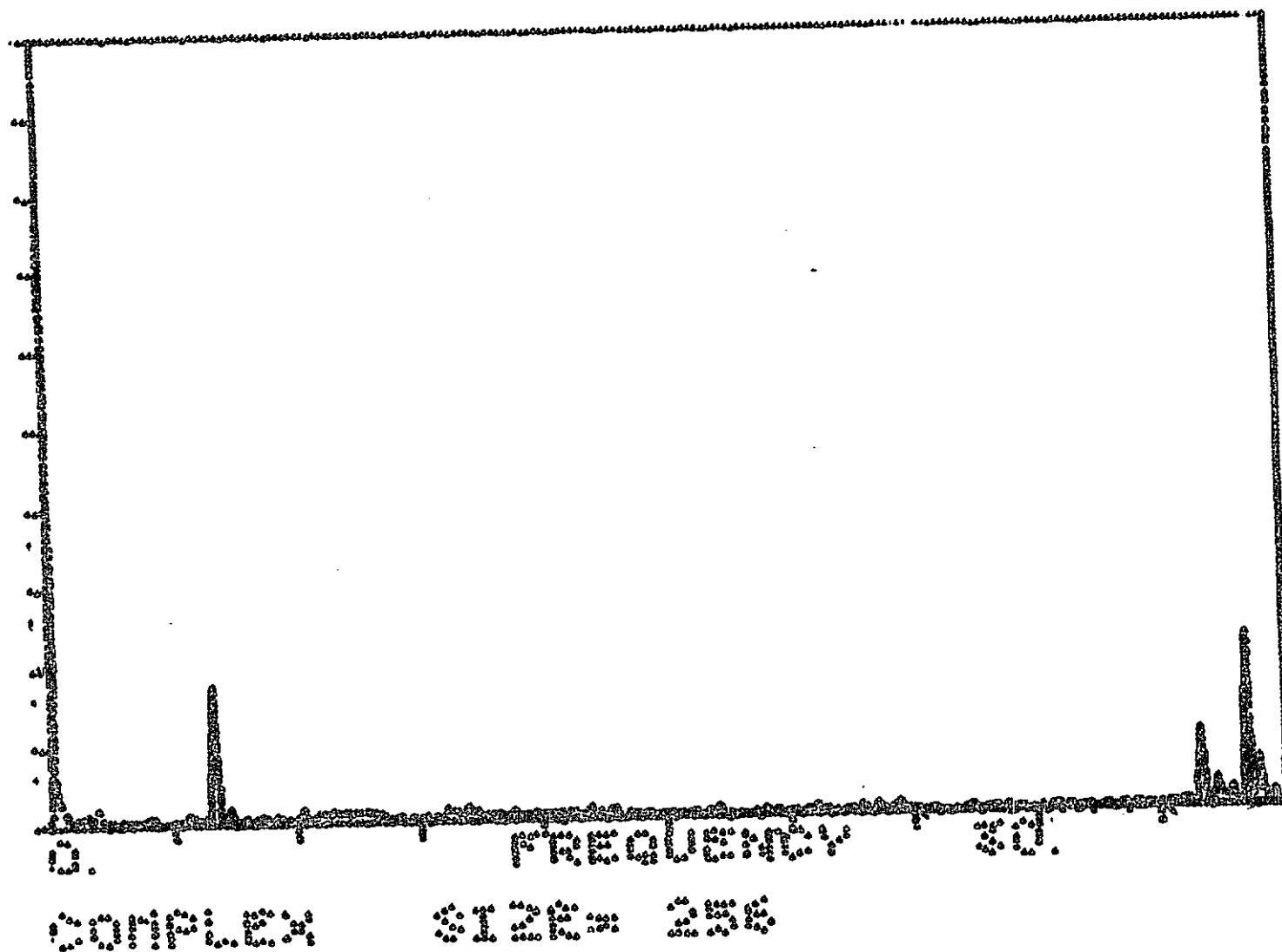
SIZE= 256

DL5/FV1

1.

114

2.

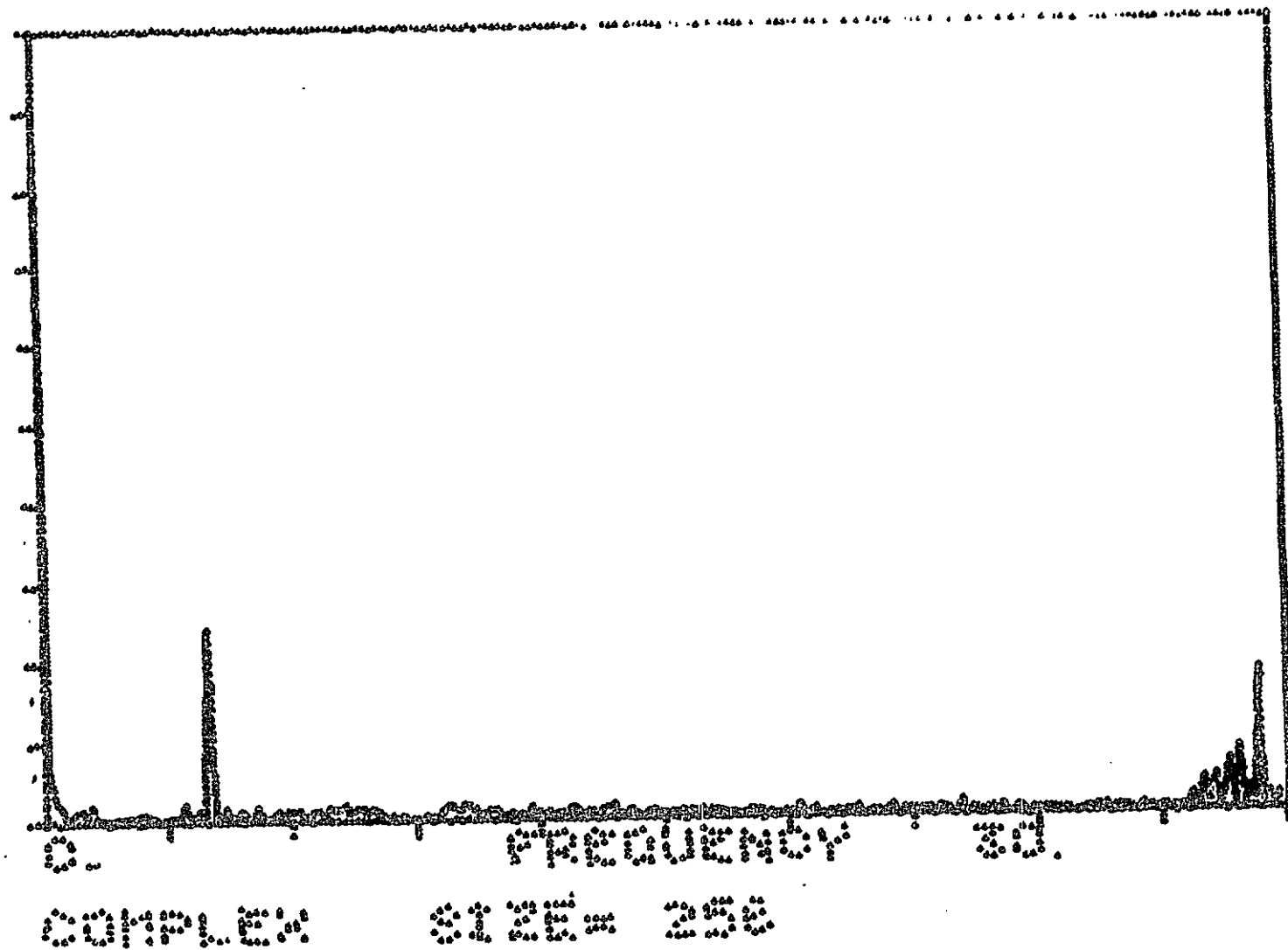


DL6/FV1

1

1954

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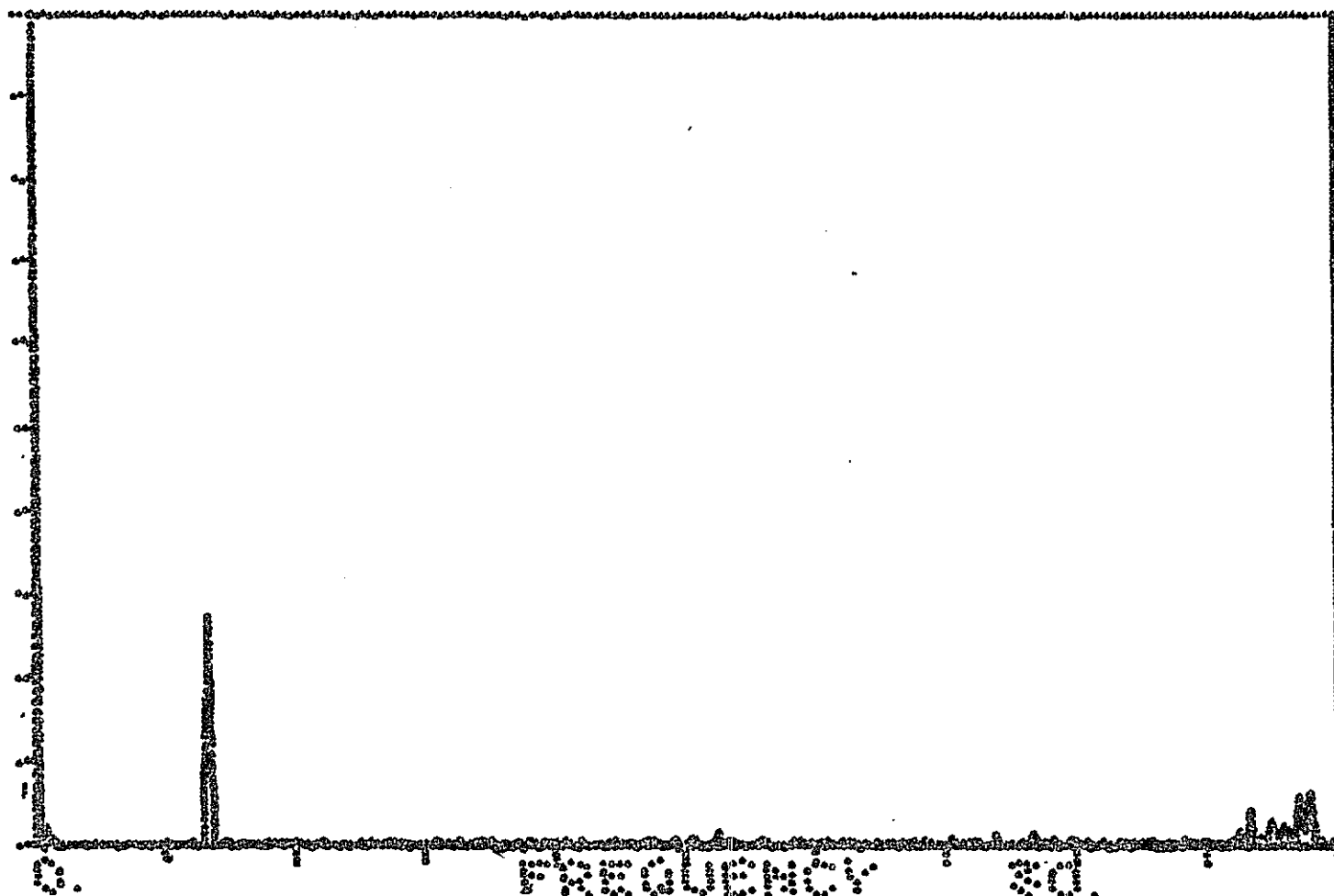


DL7/FV1

4.

non

0.



complex

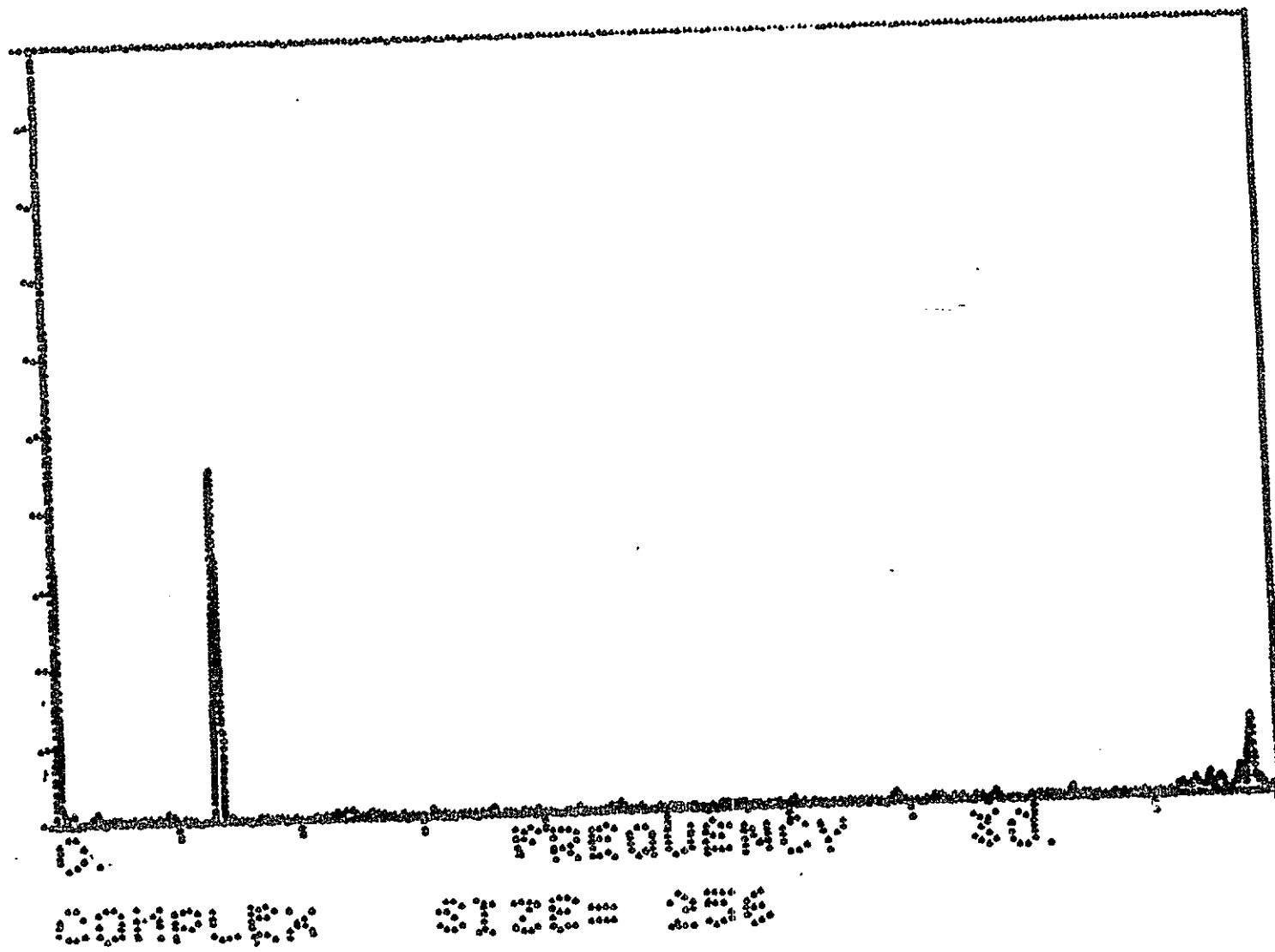
size 399

DL8/FV1

1.

1988

2.



complex size

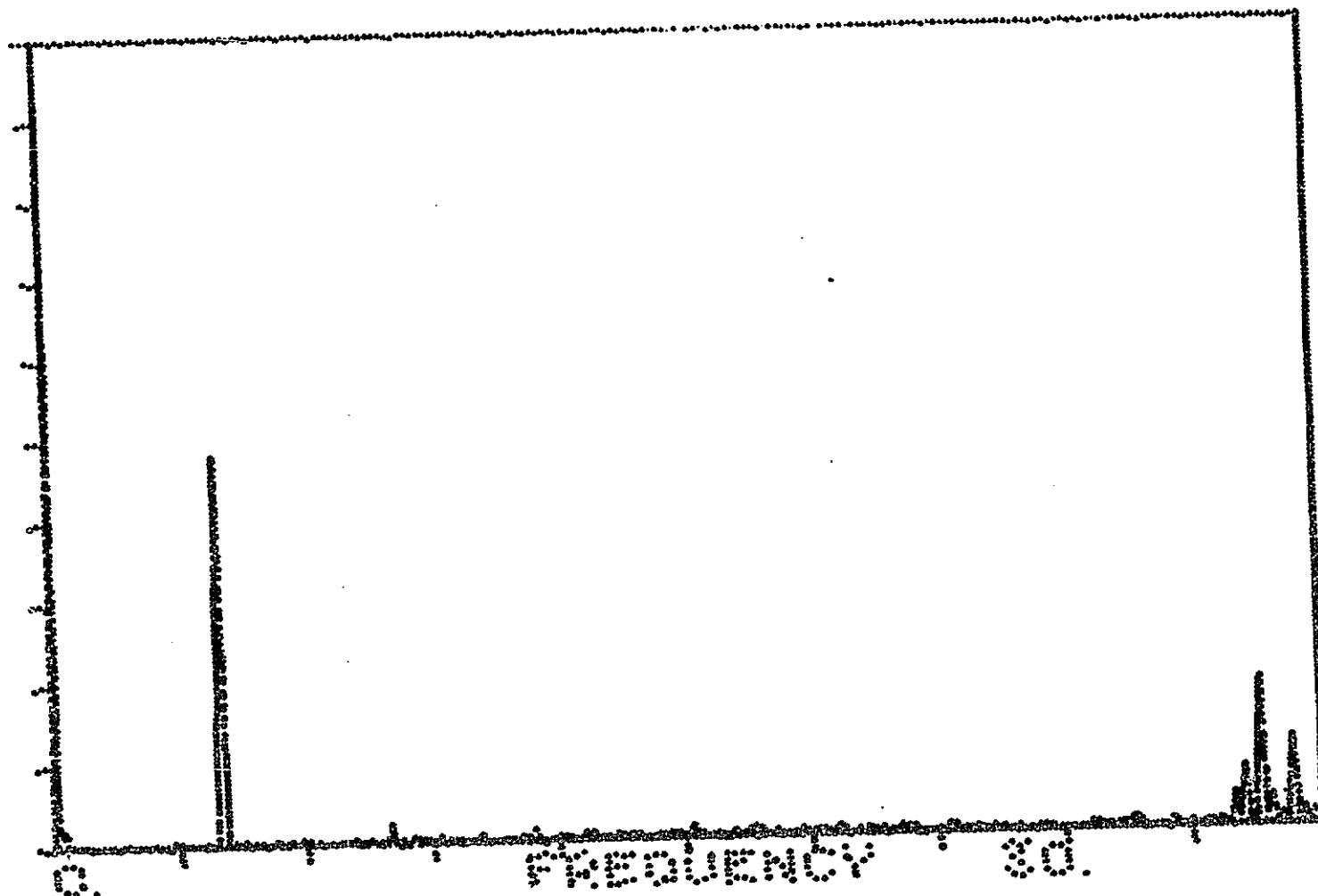
size = 255

DL9/FV1

1.

1968

0.



COMPLEX

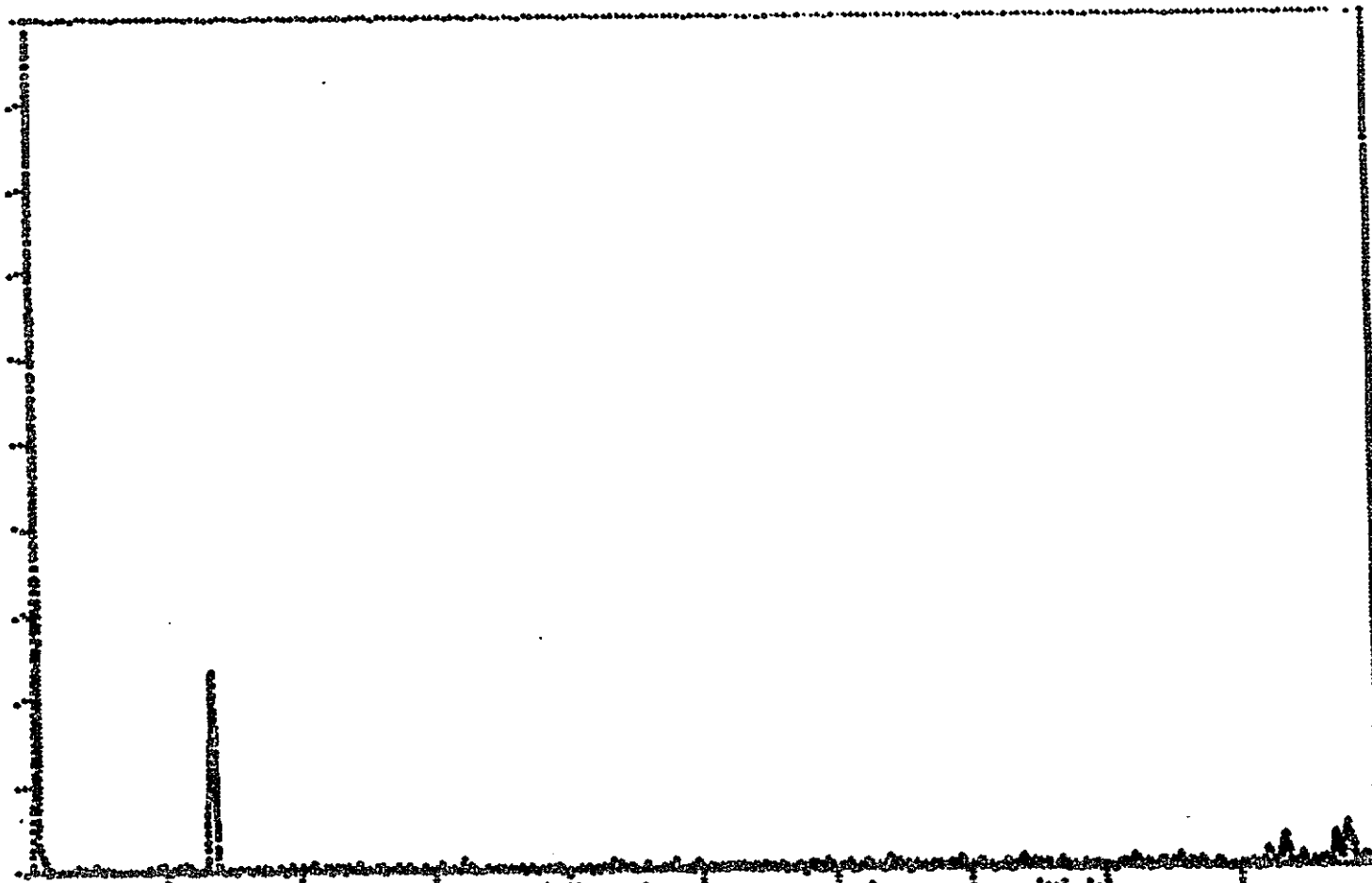
825 225

DL10/FV1

4

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10
9
8
7
6
5
4
3
2
1

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FREQUENCY

30

COMPLEX

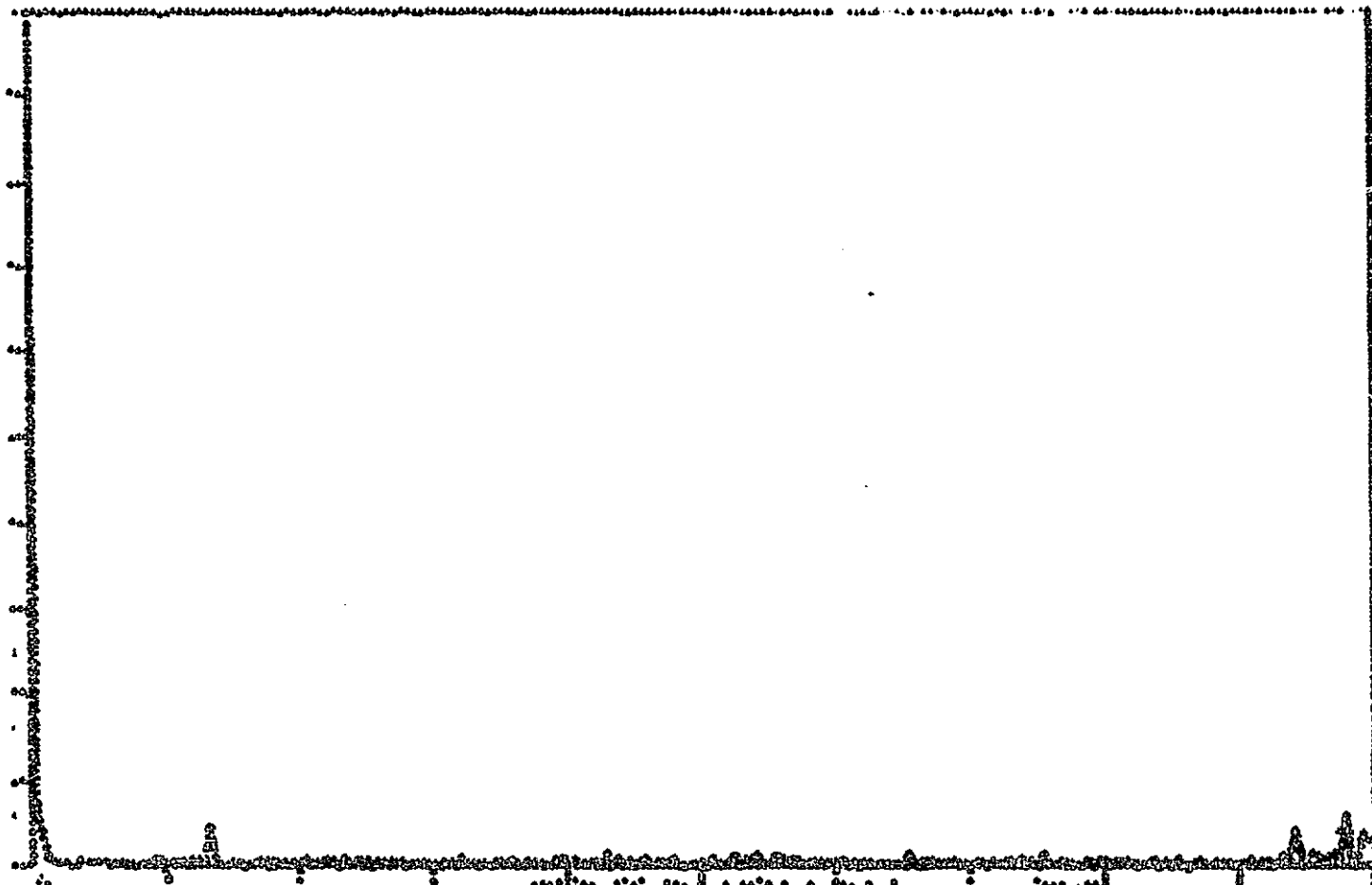
01234 056

DL11/FV1

4.

FROM

0.



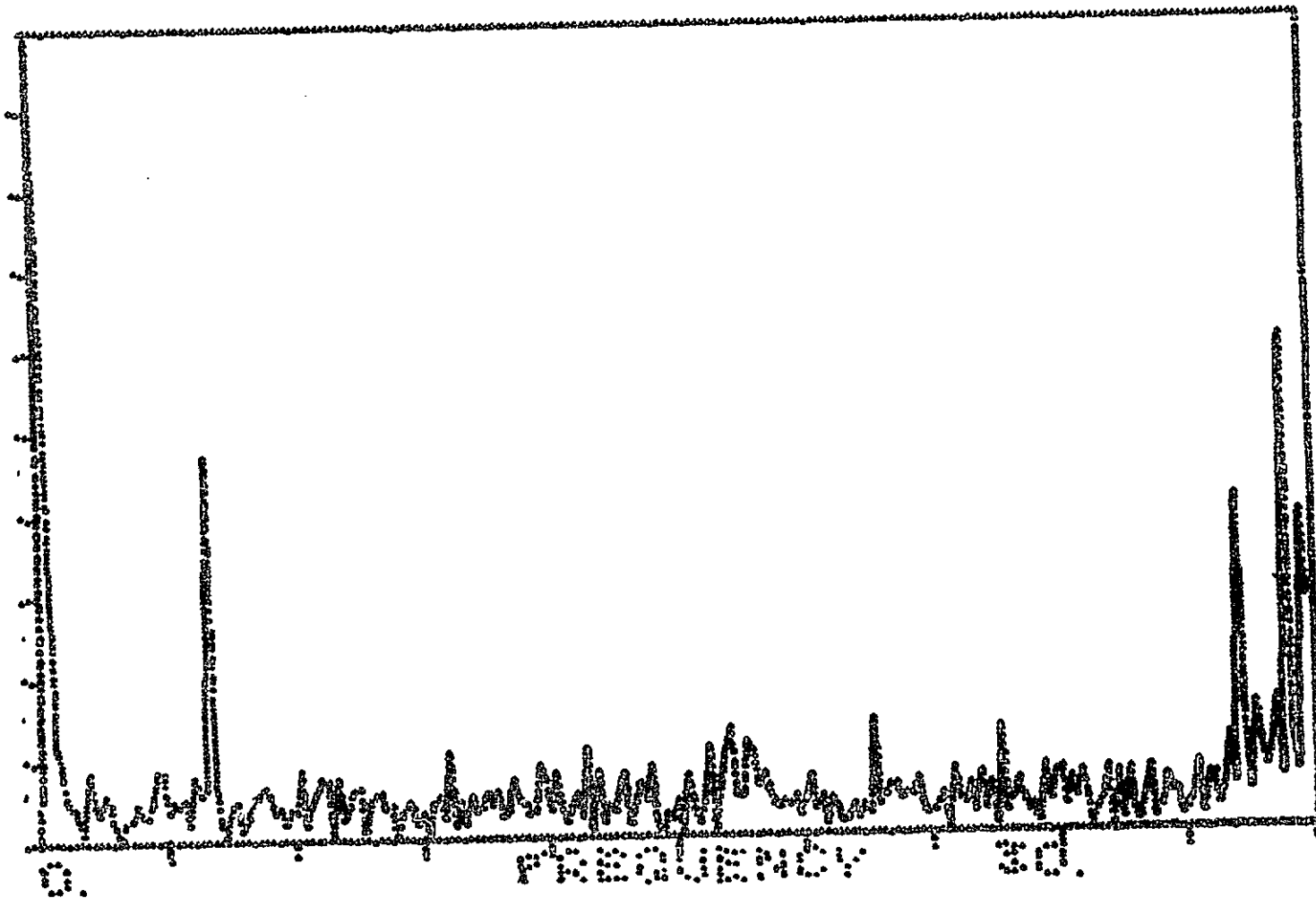
TO: DIRECTOR

COMPLER

STAN 255

DL12/FV1

1
mag



0.
COMPLEX:

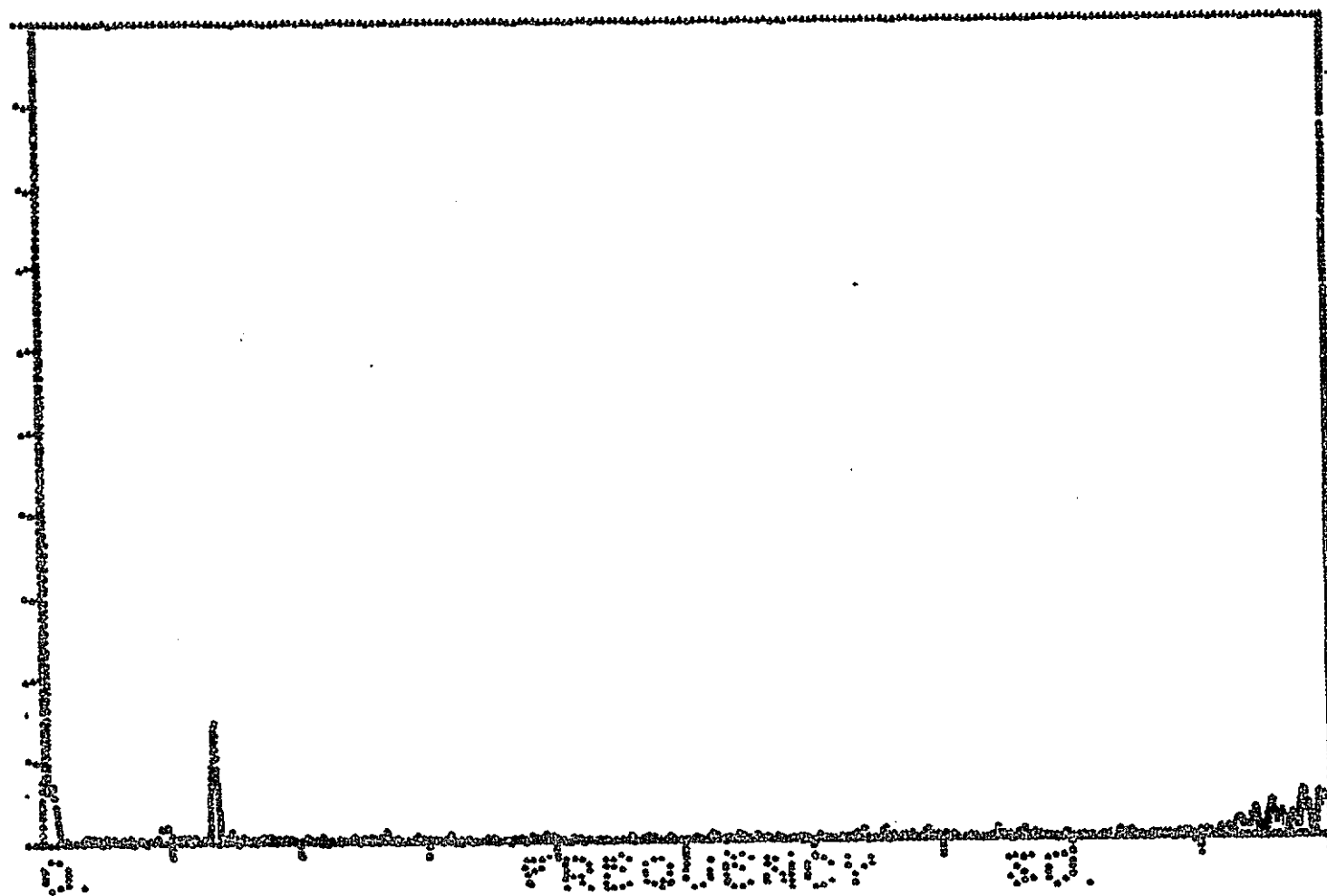
SIZE= 356

DL12/FV1

1.

mean

0.



COMPLEX

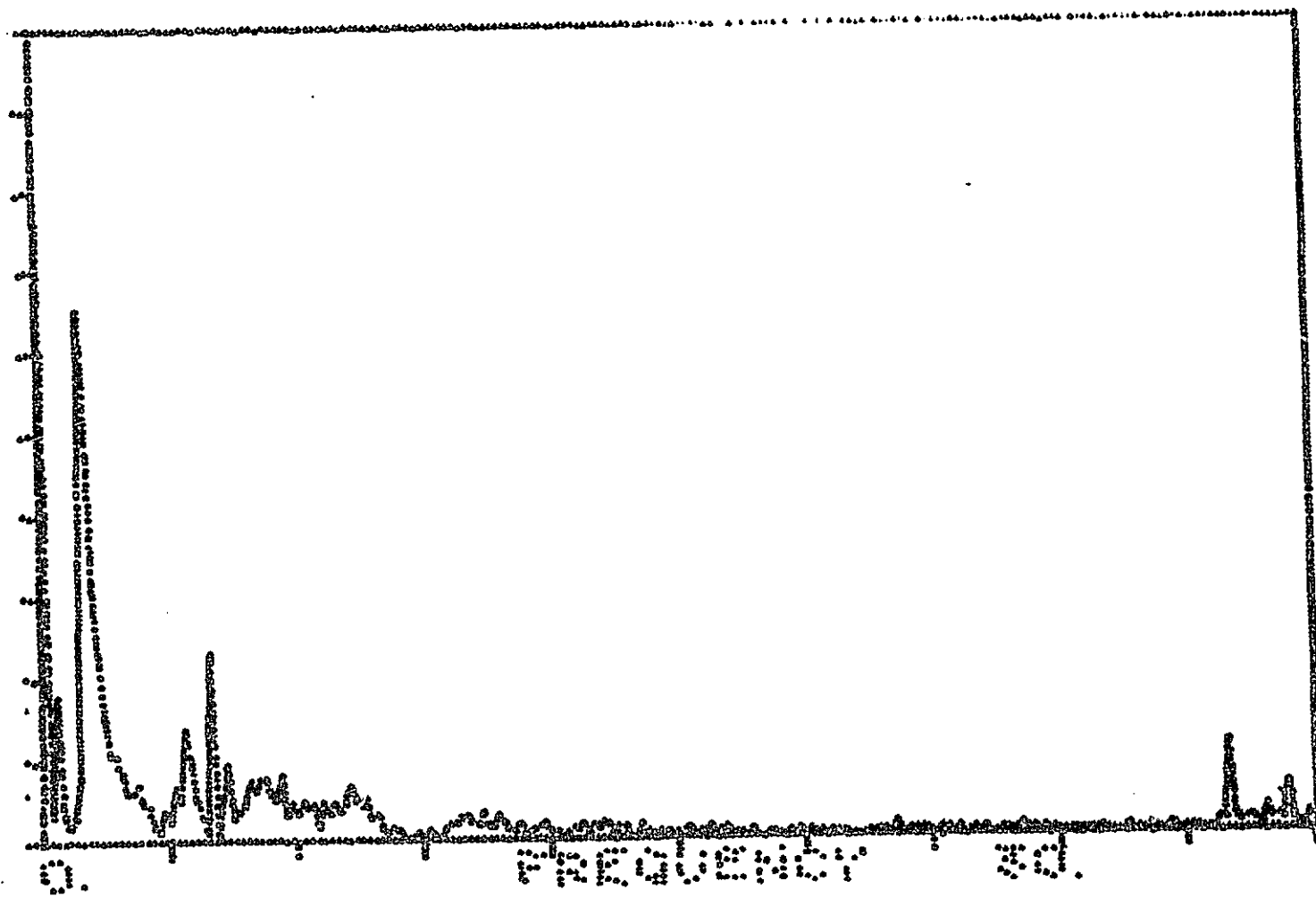
SIZE= 255

DL13/FV1

10

100

0



Complex

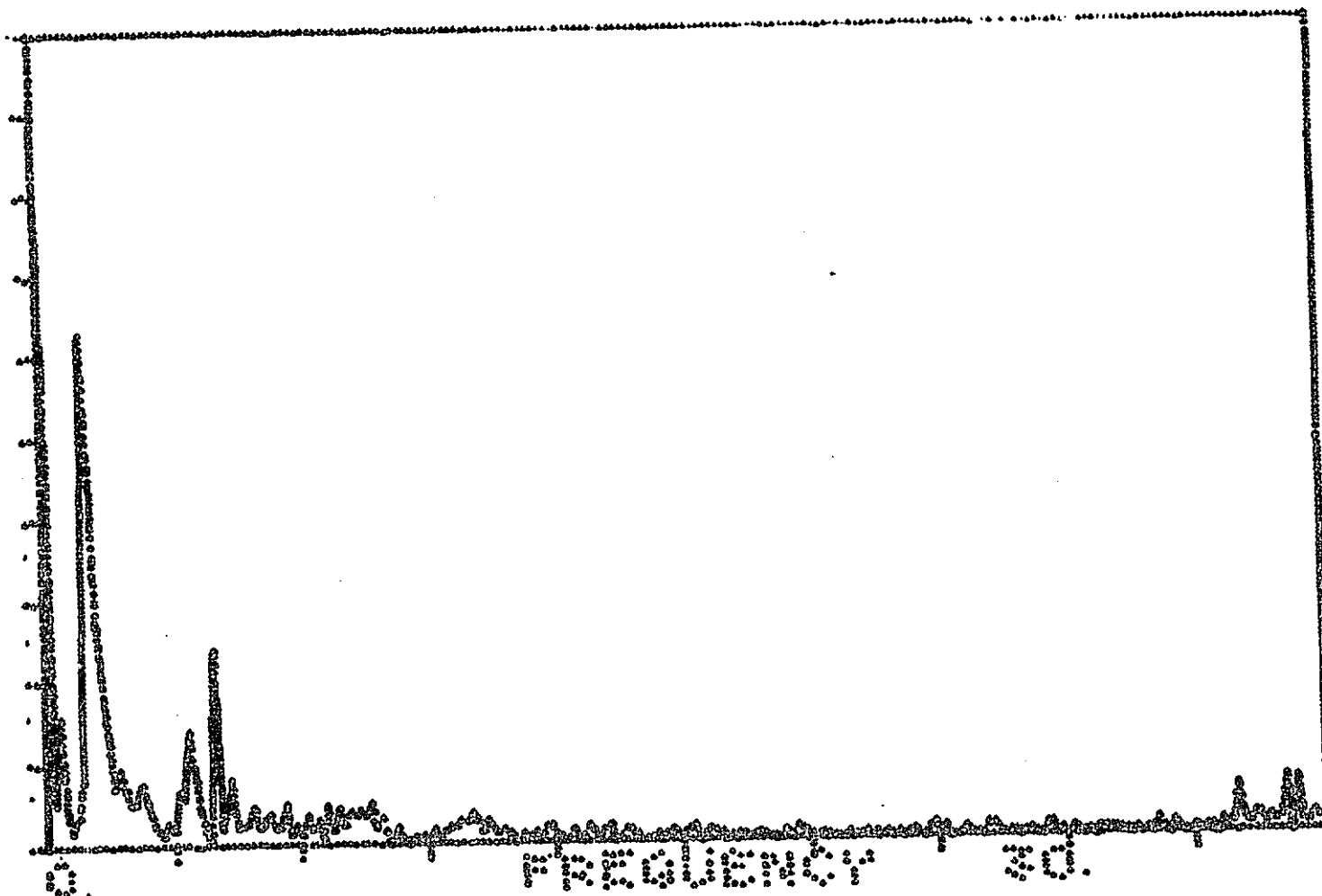
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DL14/FV1

1.

1969

0.



COMPLEX

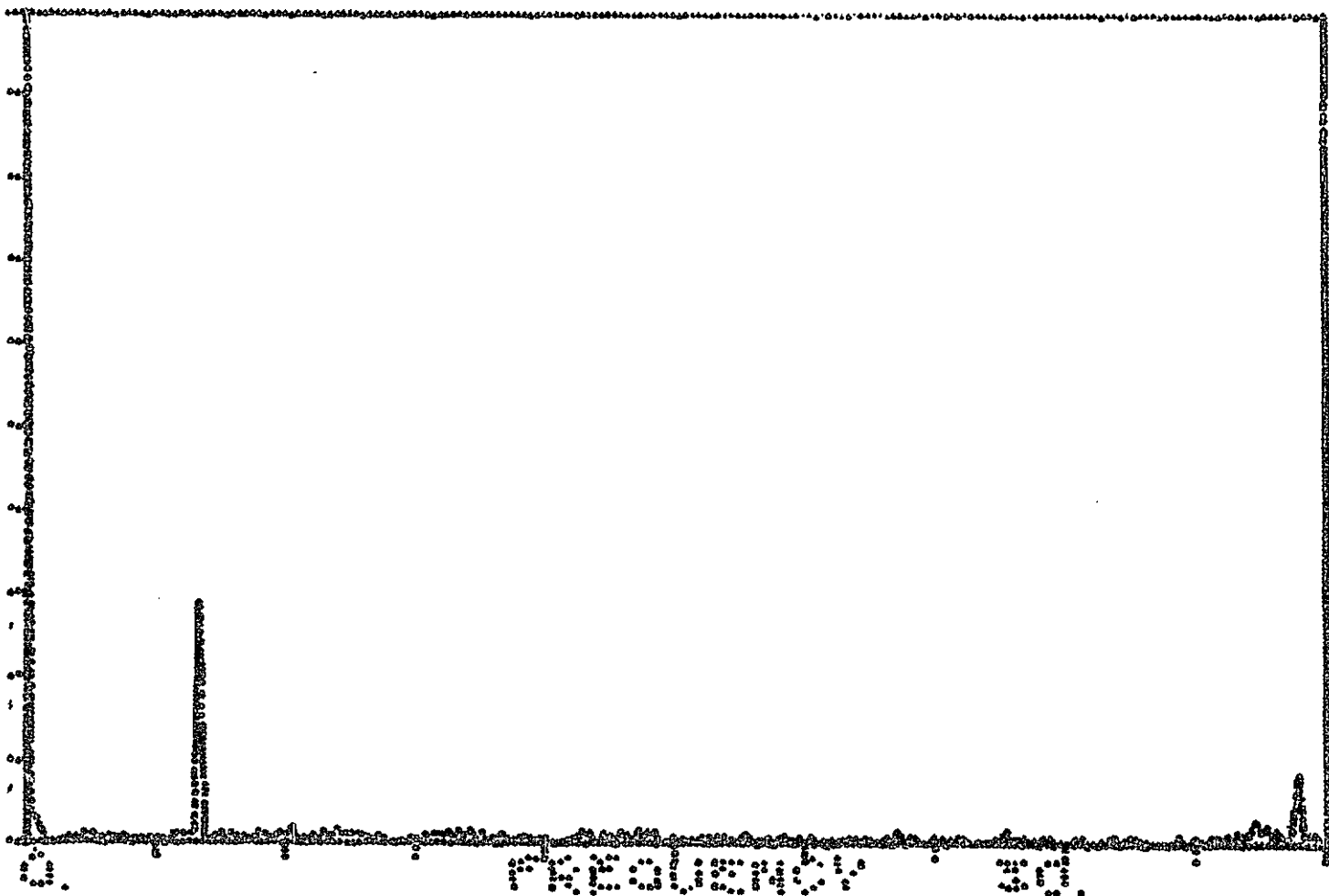
01 SEP 1969

DL15/FV1

4

AN

2



Complex

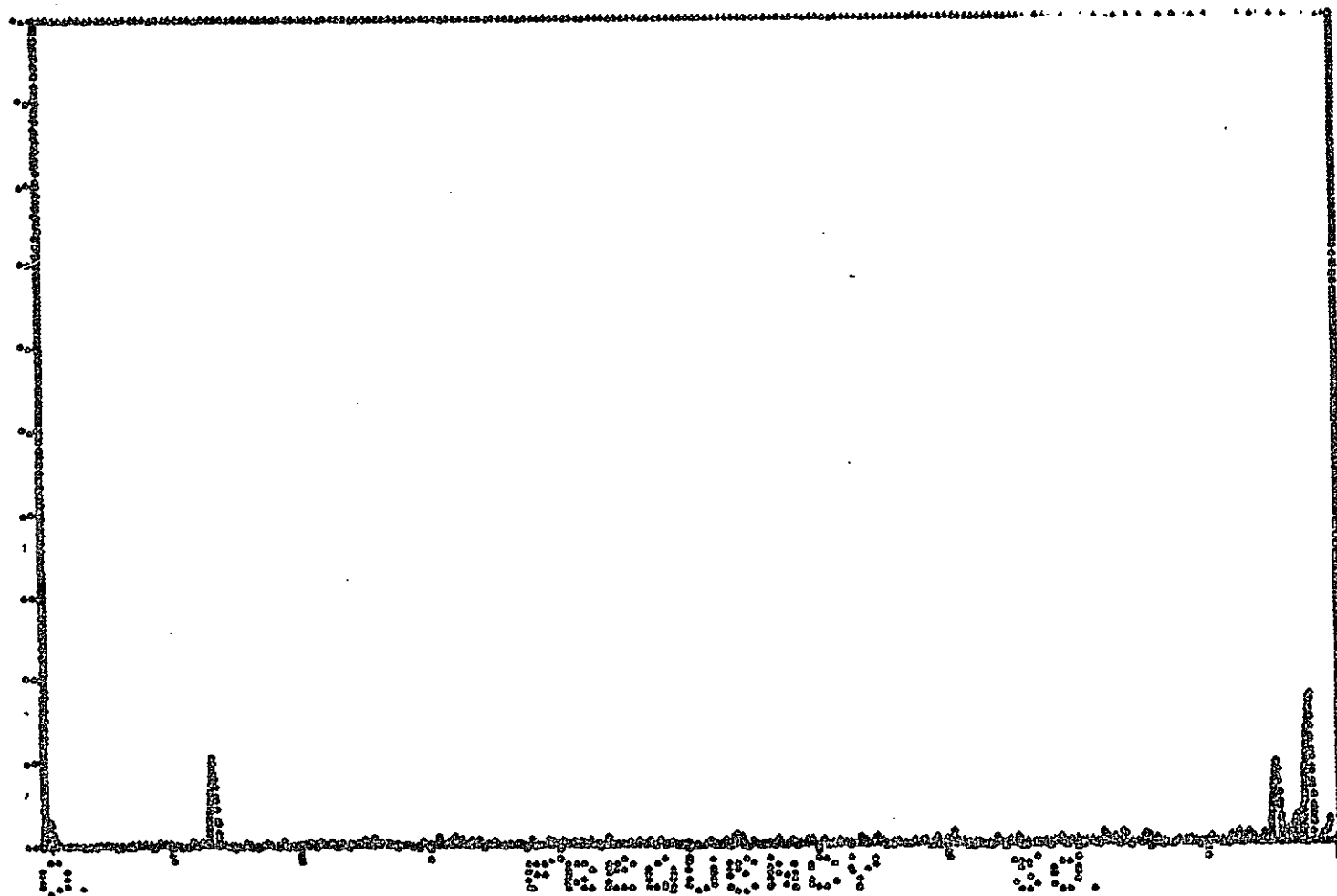
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DL16/FV1

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MAN

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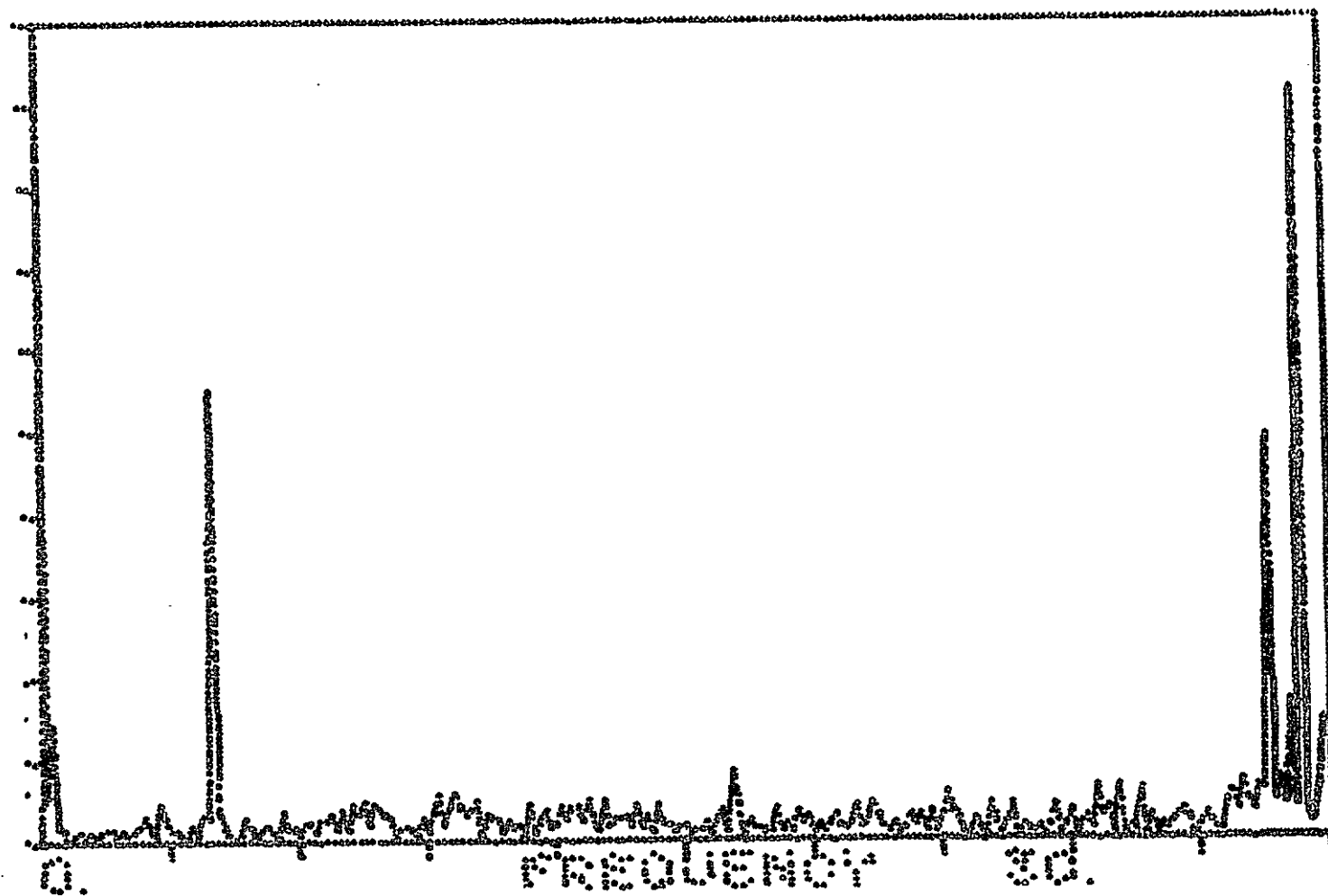
COMPLEX

SIZE 256

DL17/FV1

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COMPLEX

5128 350

DL17/FV1